AMERICAN GAS

Association

MONTHLY

OCTOBER 1945 • VOL. 27 · NO. 10

Your brainstorm...

You've got your heart set on a wonderful new kitchen . . . cool, clean, cozy . . . where everything fits together like a glove to save you time, energy and *work*. But . . . how to *get* it . . . ?

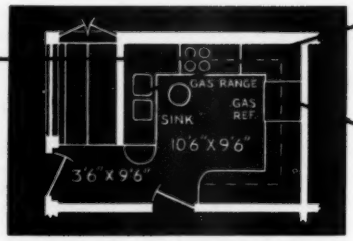
Our brainchild...

Here it is . . . every modern convenience you ever hoped for *and more* . . . in another of our "New Freedom Gas Kitchen"* designs. See how compact it is . . . how the three major work units are spaced to save you time and steps. See how cabinets and appliances dovetail, leaving no dust-catching crannies. Best of all, this beautiful, livable kitchen is *free from unwanted heat, dirt, and cooking odors!*

Result! The last word in kitchen convenience!

HANDY BREAKFAST-BOOTH KITCHEN . . . ANOTHER "NEW FREEDOM GAS KITCHEN" DESIGN

Here are the three major "freedoms" that make every "New Freedom Gas Kitchen" *click!* **NEW FREEDOM IN COOKING** . . . A miraculous new Gas range with smokeless broiler, foolproof oven baking, top-of-stove cooking so fast and flexible you'll turn out easier, *better* meals than ever before! See these new modern Gas ranges—today. And look for this CP Seal.



NEW FREEDOM IN WATER HEATING . . . thanks to a new automatic Gas water-heater . . . the most economical and efficient way to supply all the necessary hot water for a modern laundry and automatic dishwasher!

NEW FREEDOM IN FOOD STORAGE . . . a new silent Gas refrigerator . . . so spacious you'll have more room for frozen foods . . . be able to keep *all* foods at the peak of freshness much *longer*. Start planning for your "New Freedom Gas Kitchen"—today!

AMERICAN GAS ASSOCIATION

GAS THE **WONDER FLAME THAT COOLS AS WELL AS HEATS**

One story in this issue overshadows all others. It is the story of tributes paid to an individual who has made an indelible impression upon our industry. It is not so much a reflection of the material contributions that he made, although they were manifold, as it is a commentary upon the inspiring leadership that made possible unlimited contributions of many individuals, all working together as a team for the good of the whole. . . . It is to Major Forward's everlasting credit and to the great good of the gas industry, that he was able to reconcile many divergent views and to solidify and advance the progress of a unified industry. Always he seemed to have the genius of maintaining a cool, detached perspective when controversies waxed hottest, and in the end to guide decisions into wise and statesmanlike channels. . . . He has laid solid cornerstones for the industry's growth and by his unselfish personal contributions and innate good humor, has commanded the respect, loyalty and friendship of all who have been privileged to know him. . . . He has earned a permanent niche in the gas industry's hall of fame. May he enjoy the rest and well being he so deserves!

EDITORIAL OFFICES:
AMERICAN GAS ASSOCIATION
420 LEXINGTON AVE., NEW YORK 17, N. Y.

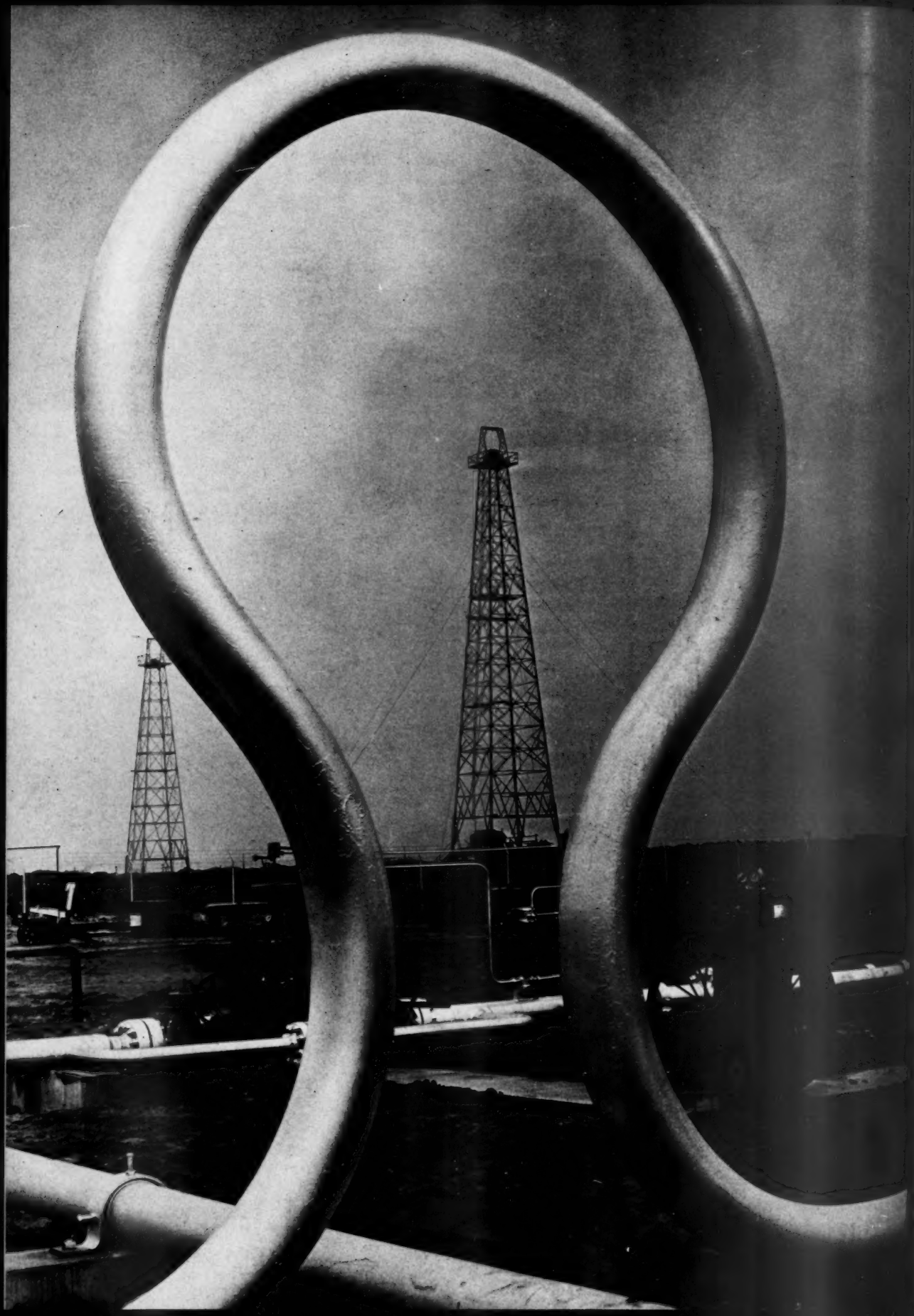
CONTENTS FOR OCTOBER 1945

FEATURES

SECTIONS

DEPARTMENTS

• Subscription $3.00 a year - Published eleven times a year by the American Gas Association, Inc. Publication Office, American Building, Brattleboro, Vt. Publication is monthly except July and August which is a bi-monthly issue. Address all communications to American Building, Brattleboro, Vermont, or to 420 Lexington Ave., New York 17, N. Y. All manuscript copy for publication should be sent to the editorial offices in New York. The Association does not hold itself responsible for statements and opinions contained in papers and discussions appearing herein. Entered as Second Class Matter at the Post Office at Brattleboro, Vermont, Feb. 10th, 1922, under the Act of March 3, 1879. Cable addresses: American Gas Association, "Amerigas, New York"; American Gas Association Testing Laboratories, "Amerigaslab, Cleveland."



JAMES M. BEALL, *Editor*

Annual Meeting Program

THE twenty-seventh annual meeting of the American Gas Association will be held on Wednesday and Thursday, October 24 and 25, in the Engineering Societies Building, 29 West 39th Street, New York, N. Y. General sessions will occupy the two mornings and one afternoon while the remaining afternoon and evenings have been set aside for meetings of Departments, Sections and General Committees.

Originally planned as a one-day streamlined business session, similar to that held last year, the subsequent coming of VJ-Day and the immediate urgency of reconversion problems caused a revision in the schedule and an enlargement of the program. The meeting now may be classed somewhat as a transitional meeting, midway between the war meetings and the full-fledged conventions of the prewar era. In addition to the formal program, it will provide an opportunity for discussion of the industry's future in the light of a peacetime perspective.

J French Robinson, president of the Association and president, The East Ohio Gas Company, Cleveland, will preside at the opening general session and will deliver the keynote address. President Robinson is expected to review the Association's record during the past year and to describe the machinery set up to cope with postwar problems.

•

The Association's financial position will be set forth in the report of the treasurer, Edward F. Barrett, president, Long Island Lighting Co., Mineola. In view of the record budget established for next year and a number of innovations in the Association's activities, this report should be of unusual interest. Election of officers will also be a highlight of the first morning's session. Ernest R. Acker, chairman of the Nominating Committee, and president, Central Hudson Gas & Electric Corp., Poughkeepsie, N. Y., will present the selections of that committee.

Feature speaker of the first session will be Ralph W. Gallagher, chairman of the board of the Standard Oil Company of New Jersey and a past president of the American Gas Association. Speaking on the topic, "The Industry and the War," Mr. Gallagher will draw not only on his great experience in the gas industry but on the vast resources of a company which enjoys a unique position in war and peace.

Progress of the Federal Power Commission's natural gas investigation to date will be reviewed by Walter C. Beckjord, president, Cincinnati Gas and Electric Company. Arrangements also have been made for the showing of the Tennessee Gas and Transmission Company's color-sound motion picture of the construction of the 1250-mile 24-inch natural gas line from Corpus Christi, Texas to Cornwell, W. Va.

The first general session will be continued Wednesday afternoon and will include a symposium of vital importance to the gas industry. Under the aegis of Mr. Acker, chairman of the Special Committee on Gas Industry Research and Promotional Plan, who will introduce the speakers, the gas industry's comprehensive research, advertising and promotional program will be revealed in significant detail. D. A. Hulcy, chairman of the Promotional Committee and president, Lone Star Gas Co., Dallas, Texas, will tell how the industry's promotional resources are being marshalled to keep gas in the forefront of its competitors. Latest developments in the New Freedom Gas Kitchen program will be described by H. Vinton Potter, director of that activity. The many ramifications of the greatly enlarged research program will be covered by E. P. Noppel, chairman, Coordinating Committee on Research, and general consultant, Ebasco Services, Inc., New York, and P. T. Dashiell, chairman, Gas Production Research Committee, and vice-president, The Philadelphia Gas Works Company.

A prominent gas company executive will open the Thursday morning general session with a discussion of the economic future of the manufactured gas industry.

Of special interest at this session will be an address by Governor Clarence Meadows of West Virginia on "Gas and Modern Living." From the vantage point of the chief exec-

● Opposite: Derrick framed in a pipeline expansion loop—a scene typical of Texas oil and natural gas fields. Long distance transportation of gas from such fields is center of current F.P.C. study (Columbia Gas & Electric Corporation photo)

utive's position, the Governor, is expected to offer some shrewd observations on the place of gas in the pattern of modern living.

A prominent place on the program has been reserved for the presentation of the Association's annual awards to individuals who have performed outstanding services to the gas industry. These include special gifts to all past Presidents, the Charles A. Munroe Award, A. G. A. Meritorious Service Medal, Million Man-hour Awards, and the McCall's Home Service Award.

The report of the Time and Place Committee for the 1946 convention will also be made at this session.

Following the second general session, company delegates will meet in executive session to elect company members, directors and the General Nominating Committee.

Details of Departmental and Sectional meetings announced to date include the following:

Natural Gas Department

The Natural Gas Department's Managing and Advisory Committees will hold a dinner meeting at 6:30 P.M., October 23, at the Engineers' Club to discuss the time, place and program for the 1946 annual spring natural gas conference. Also at this time, the various committee chairmen will review the past year's activities and make plans for next year's committee work. Included on the agenda is a discussion of the progress and development of the Federal Power Commission's natural gas investigation.

Accounting Section

The Accounting Section will hold a brief business meeting for the election of its 1945-1946 officers at the Biltmore Hotel, New York, at 4:00 P.M., October 24. This will be followed immediately by a meeting of its Managing and Advisory Committees for consideration of committee matters to be concluded under the chairmanship of C. E. Packman of Chicago, Ill., and for discussion of next year's program as outlined by the chairman of the Planning Committee, E. F. Embree of New Haven, Conn.

Industrial and Commercial Gas Section

On the second afternoon at the annual meeting, the Managing Committee of the Industrial and Commercial Gas Section, Harry K. Wrench, Minneapolis Gas Light Company, chairman, and Harry A. Sutton, Public Service and Electric Gas Company, vice-chairman, will hold its final meeting for the current Association year. Members of the new committee for next year have been invited to attend in order that this committee may start functioning by planning the activities it will supervise for the coming Association year.

The final meetings of the Food Service Equipment Committee, Roy E. Wright, New England Gas & Electric System, chairman, and the Committee on Heat Treating with Gas, Carl H. Lekberg, Northern Indiana Public Service Company, chairman, will be held on the first afternoon. At this time they will report on their accomplishments during the past year and make recommendations for the work to be undertaken during the coming year.

The National Advertising Committee of the Industrial and Commercial Gas Section, J. P. Leinroth, Public Service Electric & Gas Co., chairman, will also meet on the first afternoon to make plans for the advertising program for next year.

Technical Section

The Technical Section will hold a meeting at 6:30 P.M., Tuesday, October 23, at the Biltmore Hotel, New York, for election of officers. This will be followed immediately by a dinner meeting of the Managing and Advisory Committees of the Section for consideration of present committee assignments made during the chairmanship of L. E. Knowlton of Providence, R. I.—the Section's present chairman—and for discussion of future plans for next year during which the chairman-elect will preside.

Plans have not yet been consummated for the holding of individual committee group meetings during the afternoons of October 24 and 25, but it is tentatively proposed to hold a meeting on October 24 of incoming Technical Section committee chairmen and vice-chairman for a round table discussion of 1945-1946 committee plans.

Meeting of the American Gas Association's Executive Board September 12 in New York—the final meeting before the beginning of a new fiscal year and the retirement of Managing Director Alexander Forward. Seated left to right, are: Major T. J. Strickler, F. M. Banks, Kurwin R. Boyes, Managing Director Forward, and President J French Robinson. Standing: John W. West, Jr., George H. Smith, E. J. Tucker, Hudson W. Reed, Lyle C. Harvey, Vincent T. Miles, Harry K. Wrench, Marcy L. Sperry, H. Leigh Whitelaw, E. P. Noppel, John Van Norden, H. R. Cook, Ernest R. Acker, Vice-President E. J. Boothby, Vice-President R. H. Hargrove, Treasurer Edward F. Barrett, and C. A. Tattersall

Gas Production Research Program

Discussion of organization, objectives and progress to date of the vastly expanded A. G. A. program designed to provide better gas-manufacturing processes

Edwin L. Hall

BY EDWIN L. HALL

Secretary-Coordinator, A. G. A. Gas Production Research Committee

DURING the past few months the American Gas Association Gas Production Research Committee has been organized and has started to function as a part of the Association.

The Gas Production Research Committee is in charge of the Association's research activities devoted to gas production processes. The committee consists of P. T. Dashiell, chairman, Philadelphia; A. M. Beebee, Rochester; E. G. Boyer, Philadelphia; L. J. Eck, Minneapolis; H. M. Henry, Cambridge; A. B. Huyck, Brooklyn; C. A. Lunn, New York; H. B. Noyes, Washington; R. H. Philipps, Newark; D. S. Reynolds, Boston; J. H. Wolfe, Baltimore, and Karl Emmerling, Cleveland.

Technical Advisory Committee

The above committee is aided and advised by a Technical Advisory Committee consisting of F. J. Pfluke, chairman, Rochester; Dr. F. H. Dotterweich, Washington, D. C.; F. W. Hartzel, Philadelphia; C. W. Jordon, Philadelphia; E. J. Murphy, Brooklyn; T. L. Robey, Washington, D. C.; C. C. Russell, Kearney, N. J.; A. C. Sedlachek, Philadelphia, L. Shnidman, Rochester; R. Van Vliet, Staten Island, Dr. C. W. Wilson, Baltimore, and E. W. Zimmerman, Everett.

The committee's activities have been varied, as must be true of all committees that undertake new tasks. A large part of the time of both committees has been devoted to the selection and definition of their proper spheres of activity. The relation of these committees to other departments of the American Gas Association and the correlation of committee activities with the activities of those private companies and organizations that operate research departments have been discussed and defined.

The Gas Production Research Committee believes that maximum results in the evaluation of processes and apparatus can be realized by obtaining the cooperation of all units of the gas industry and of associated or related industries. The committee is convinced that such cooperation will accelerate the progress of the research and develop the program on the soundest possible basis.

Allied Industry Cooperation

To this end every effort is being made to obtain the cooperation of the construction and engineering companies that are familiar with the problems of the gas, coal and oil industries. The committee hopes to encourage research and development by these companies of processes and apparatus that will be of interest to the gas industry. It earnestly desires to avoid any unnecessary duplication of effort and hopes to serve as a clearing agency for projects sponsored by private institutions and companies.

The committee is aware of the ultimate necessity of making large scale pilot or plant tests and as a result is budgeting its resources so that a substantial reserve for this purpose may be available when the need develops.

During these past few months the committee's work has been divided into three general phases.

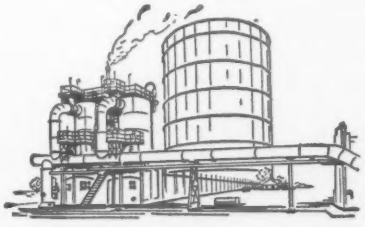
First, it has sponsored and financed certain studies that were either under way or proposed by the Institute of Gas Technology at the time the committee was organized, and has also initiated one other research project at Battelle Memorial Institute.

Second, it has encouraged the study of certain phases of plant operation in order to determine the limitations of existing production equipment.

Third, through consultation with various companies both within and without the gas industry, the committee has encouraged these companies to consider the problems of the gas industry and the possible application of their processes or methods to the production of manufactured gas.

Institute of Gas Technology

At the time the Gas Production Committee was organized a study was under way by the Institute of Gas Technology for the Technical Section of the Association. This was a survey of processes used in Europe with inferior fuels or under special economic conditions for the production of gas of calorific value suitable to European practice. Most of these processes have



not been used in America, mainly because the calorific value of the gas produced does not fit American requirements, and it will not be possible to select any of these processes for direct application to American practice. The survey is being completed and it is hoped that a study of these processes may lead to modifications that could be applied to the fuels that are available or used in this country, and to produce gas of a calorific value required in this country.

One immediate requirement of many gas companies is a relatively inexpensive method of producing peak load gas. The desirable objective for all

companies is improved methods for producing base load and peak load gas so that savings over present operating methods may be realized.

When these committees were formed they found that the industry through the Institute of Gas Technology and various committees of the Technical Section was considering several laboratory research projects. These projects were carefully reviewed by the two committees and as a result investigations or laboratory research work or both are now in progress at the Institute of Gas Technology and at Battelle Memorial Institute on the following projects.

Study of Existing Processes for the Catalytic Gasification of Propane

This study was started at the Institute of Gas Technology and was continued by Benjamin Miller, now a consulting engineer, who was associated with the Institute when the project was started. As a result of this study it is evident that existing processes are available and can be used by the industry for the catalytic gasification of propane. The study is being continued in order to develop more information about these processes and to encourage the development of more flexible processes for this purpose.

One member company of the Association has signed a contract for the installation of a plant which will catalytically reform natural gas, and other companies are now convinced that if they desire they can install plants to be purchased from reliable equipment manufacturers which will catalytically reform propane and other LP gases for their peak load demands.

Atomic Power

● Atomic power, as a servant of mankind rather than as an agent of destruction, may find one of its first applications as a new source of energy to drive gas turbines, in the opinion of many members of the gas turbine coordinating committee of the American Society of Mechanical Engineers, which has begun preliminary study of the place which may be filled by the world's latest discovery in the field of power sources.

"Atomic power is an addition to the world's supply of fuel," stated R. Tom Sawyer, chairman of the committee. Mr. Sawyer, of the American Locomotive Co., a recognized authority on diesels and gas turbines, and author of the recently published book, The Modern Gas Turbine, said: "It is felt that atomic power certainly will not replace present fuels but will supplement them, as oil supplements coal."

"A. G. A. Monthly" Wins Contest Award

SELECTED as one of the "national leaders" in the annual magazine contest conducted by the National Council of Industrial Editors, the AMERICAN GAS ASSOCIATION MONTHLY last month received an award certificate. Approximately 400 industrial publications from many parts of the country were entered in the contest which was judged on the basis of "appearance, excellence of editorial content and appropriateness to purpose." A limited number of entries were singled out as leaders in their respective fields. There was no attempt made to classify the winners as to first, second or third place.

Catalytic Gasification of Higher Hydrocarbons

The known results of the catalytic gasification of propane have encouraged an attempt to use this method for the gasification of higher hydrocarbons, gasoline or gas oil for example. This investigation is being conducted by the Institute of Gas Technology. The problem is difficult and requires many preliminary orientation tests; progress has been made but at this time no results have been obtained that would encourage the use of a catalytic process as compared to the more familiar thermal or pyrolytic processes.

These catalytic processes are being investigated as possible methods of producing peak load gas. For this purpose the plant investment cost must be relatively low but the materials cost may be comparatively high.

Analysis of Equipment, Present and Available

Mr. Willien of the Institute of Gas Technology and Mr. Hartzel of the Technical Committee of the American Gas Association are cooperating on a study of methods of increasing the capacity of existing carburetted water gas plants. This study requires time and effort but offers rewards in the development of modifications that will increase the capacity of existing apparatus with minor modifications.

Study of the Oxygen Steam Carbon Reaction

This study is a fundamental study that was originally recommended by the Oxygen Committee of the Technical Section. The study is to be made at both atmospheric and elevated pressures. The laboratory work is being done at the Institute of Gas Technology and a pilot plant investigation has been authorized at Battelle Memorial Institute.

Sulfur Resistant Catalyst

Most of the fuels available to the industry contain sulfur which is a poison to most catalysts. Catalysts must be selected for the particular task that they must perform so that this project becomes a part of almost any other catalytic gasification project that may be considered. At the present time work on this project is active in connection with the project of catalytic gasification of higher hydrocarbons mentioned above.

Flash Pulverization

The method of using a steam jet to pulverize materials was developed at the Institute of Gas Technology. The possibilities of this process when applied to the pulverization of coal and coke are being further investigated at the Institute as a project of the Gas Production Research Committee.

Flash Gasification

The gasification of powdered solid fuels or atomized liquid fuels in the presence of steam and oxygen presents an interesting subject for study. Laboratory apparatus for conducting an investigation of the possibilities of this project is now being constructed at the Institute of Gas Technology.

An example of the cooperation that is available from other institutions is the recent procedure of Bituminous Coal Research Inc., in making their reports on *(Continued on page 463)*

Birth of a Miracle

Origin and development of silent automatic gas refrigeration, a system for which experts claim a life of more than 100 years

BY WALTER P. WOOD

Servel, Inc., Evansville, Ind.

BACK in the first century A.D., Nero was known for more than his fiddling. He had wealth, prestige, and, as history tells us, a great taste for cooled wine, so he had slaves carry snow all the way down from the Alps. His contemporaries were unable to afford this luxury, but up through the years the appeal for cooling drinks and foods was not lost.

Not until the nineteenth century, however, did the common people enjoy the luxury Nero knew. The ice was taken from ponds and lakes and stored for summer use. The quantity, of course, was unpredictable and men began seeking ways to manufacture ice.

Carl G. Munters was one of these men. In 1918, then just a 21-year-old Swedish student, he became interested in refrigeration because his father suggested it afforded an excellent field for advancement. At that time there were several commercial ice plants and a number of principles for making ice. Few of them, however, were considered sound for home use, a field he knew was still more or less unexplored.

Young Munters studied the principles of refrigeration and came across the absorption principle of making ice from heat discovered by two Frenchmen, the Carré brothers. He did not get to do much with his studies then because he was one of six students chosen to enter the engineering corps of the Swedish Navy as a specialist in marine architecture.

Because of his proficiency in this field, he got the opportunity to take advance studies in the Royal University of Technology in Stockholm. There he developed a self-starter for automobiles, and after selling his patent, he had enough money to continue his experiments in refrigeration.

He then met Balzar von Platen, a classmate who was also interested in refrigeration. The two then built a small model refrigerator based on the Carré principle, using ammonia and charcoal. It worked, but to control the heat they had to set up a system of balanced weights. This made it impractical and too bulky for household use.

Carl G. Munters and Balzar von Platen, Swedish discoverers of gas refrigeration principle

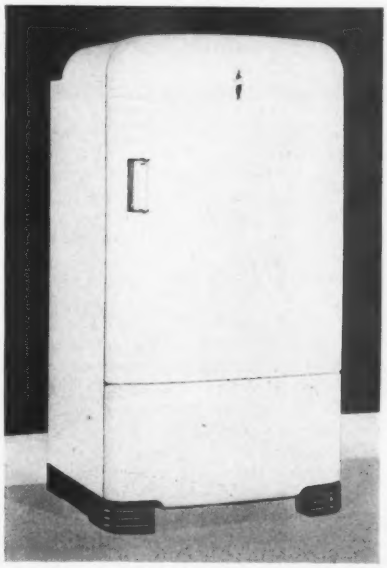
They abandoned this theory and began experimenting again. This time they developed and built a model using the ammonia and water principle, and since it was so much better, they patented it. By that time they had used up most of their money. Finally, they persuaded Hugo Tildquest of Stockholm, a distributor of electrical and railway supplies, to finance them in their search for an even superior product.

Again they set to work, now trying to find a way to eliminate the valves they used to equalize the pressure between the high and low sides of the system. They finally selected hydrogen as the ideal element for this purpose and built a 4 x 7-foot unit that provided three cubic feet of storage space.

When they were able to get a temperature as low as 13 degrees F., they knew they had an absorption cycle of refrigeration that was practical for small units. So at this point they hired George Johansson, a classmate, to draw their plans to enable them to patent this refrigerator. In their thesis explaining this invention, they reported the absorption system units "involve no moving parts, and can be hermetically closed units which do not need any other attendance, but to be supplied with the heat necessary to operate them."

This was in 1922, and several months of the next year were spent in ways of reducing the size of the re-

J. C. Kellner, Jr., showing a 1927 gas refrigerator, one of the first made in this country



The 1945 model reflects refinements in engineering as well as many convenience features

frigerator. During this time their patent had received considerable publicity and Electrolux AB, makers of vacuum cleaners and other electrical appliances, bought their patents and retained Munters as head of the research staff.

In the fall of 1925 this refrigerator, operated electrically because electricity was so very cheap in Sweden, was exhibited in this country, but manufacturers were not interested. They maintained that the cost of operating this new unit with electricity was too high and felt it would be too much of a change over from their conventional system of compressing and condensing.

In 1926, however, Servel, a firm then producing electric refrigerators and truck bodies, bought the American rights and went to work converting it into a gas-fired unit. They felt the gas industry would welcome a refrigerator to help combat the inroads the electric utilities were making in the kitchens of America.

They were right, for considerable interest was shown at its first public appearance at the 1926 American Gas Association convention in Atlantic City. This refrigerator, selling for approximately $300.00, enjoyed a certain amount of popularity when it was placed on the market, but the installation was costly. It was a water-cooled unit, so water and drain connections were necessary in addition to the gas connections.

Then, in 1933, Servel, now incorporated and centrally located in Evansville, Indiana, introduced an air-cooled model, eliminating all but the one connection. Dr. W. R. Hainsworth, vice-president of Servel in charge of the Engineering Department, eliminated the water system by placing fins on the condenser pipe.

As a result of this development, the Servel gas refrigerator became almost overnight a major factor in the refrigeration business. This opened up a vast rural and farm market; and models to operate on bottled and tank gas and kerosene were quickly introduced. Since then hundreds of improvements and refinements have been added to make the unit more practical and efficient.

Air Conditioning Unit

Then, to carry the process one step farther, this system is now being used, along with a gas heating unit, as a part of a new all-year gas air conditioner for homes and small business establishments.

This absorption system, using no moving parts, is hermetically sealed and should, some experts say, last over 100 years under general use. Heat from a gas flame is used to drive off ammonia gas from a strong water-ammonia solution, and the gas is liquefied in a condenser. The liquid ammonia then passes to the evaporator, or cooling unit of the refrigerator in which it changes back to the gaseous form, absorbing heat in so doing and thus producing the desired chilling effect. This evaporation of liquid ammonia takes place in an atmosphere of hydrogen gas, hydrogen being used in the evaporator to provide the necessary circulation of the refrigerant, since no pump or other mechanical device is used for that purpose. The whole system is sealed, so there is no chance for leakage of the gases. In a sense, the system is made up of three circuits, or cycles. One of these involves the flow of ammonia; the second, the flow of the hydrogen gas; and the third, the flow of the cooling agent.

The Carré brothers had a theory of absorption type of refrigeration; Munters and Platen developed the system; and Servel improved it and gave it a gas flame. This is one way in which man has improved upon Nero's slaves' system of cooling his drinks and food.

Welsbach's Laboratory

THE London *Gas Journal* for August 15, 1945 published the following letter from D. Douglas Gill giving an historical footnote of interest to the gas industry:

"Recently, whilst reconnoitering in Southern Austria for a camp for my company, I came across an attractive chateau set high up in the wooded hills of Carinthia, well off the beaten track. The owner proved to be Dr. Baron Hermann von Welsbach, son of the famous scientist whose name is so well known to the Gas Industry in connection with gas mantles. The laboratory, in one wing of the castle, is preserved almost in its original state. The present Baron Welsbach recently presented to me a photograph of his father as a souvenir."

Chefs Are Peculiar

● Chefs are peculiar people but just the same I wouldn't mind being one, for here is a profession which will never know decline. As Rudyard Kipling put it: "A good cook's a King of men—besides being thunderin' well off if 'e don't drink. It's the only sure business in the whole round world."

I seriously warn G.I. cooks to stick to their solid and interesting profession when they shake off their uniforms and re-enter civilian life. They had their sound preliminary training in the Army or the Navy, and with a little further effort can become full-fledged chefs. With no immigration for the past few years there is a shortage of French and Italian chefs, and it wouldn't be a bad idea if American boys would fill their empty places.

Chefs are thought to be peculiar because as a rule they have the temperament of a prima donna, and also because they seldom eat their own concoctions. As a matter of fact, they seldom eat at all! The fumes emanating from the dishes which they have inhaled for a number of years, together with the incessant tasting, kill their appetite. A chef sits down to his meal with the expression of a martyr, and masticates with reluctant jaws as though it were an effort. So if you live for the pleasures of the table, forget about being a chef.

The gentlemen of the kitchen have every right to be temperamental. It's not so bad in the very few private households which still employ chefs, but in restaurants they have the headaches of a thousand housewives. Not only do they have to master every phase of cookery, but they must be expert managers, buyers and crackerjack bookkeepers.

An executive chef *(chef de cuisine)* of a restaurant or a smaller hotel where there is no steward or storekeeper, has to rise at daybreak—the bakers need their ingredients by five in the morning, the subordinate chefs need potatoes and celery and onions and butter and crackerdust; the arriving provisions (dairy products, fish, and meat, and fruit) must be examined scrupulously; the cooking wines have to be brought up from the cellar; meat has to be cut; menus have to be thought up and written; rebels have to be discharged, new help has to be interviewed; the owner or manager has to be soft-soaped or bawled out—and if the chef falls down on any of these complicated jobs, chances are the kitchen will not catch up with the work during the whole day. One or two misses on the part of the chef, and everything is disrupted.—Excerpt from article "Man the Kitchenette" by Iles Brody published in October *Esquire*

Accident Experience in 1944

Frequency and severity of gas utility industry accidents in past year show large increase as a result of war conditions

BY IRVIN DUNSTON

Senior Statistician, Statistical Bureau, American Gas Association

THE Statistical Bureau of the American Gas Association, cooperating with the National Safety Council, each year collects and summarizes quantitative information describing the accident experience of the gas utility industry. Some of the salient figures for 1944 are presented here. These data are from Bulletin No. 57 of the Statistical Bureau, *Accident Experience of the Gas Utility Industry in 1944*, (June, 1945). Copies of the bulletin are available for distribution to interested persons.

One important change in an analytical classification which was made in the 1944 report is also described in this article. The statistical summary is supplemented by an annual publication of the Accident Prevention Committee covering fatal accidents that occurred during the year, their probable causes, and safeguards adopted (or suggested) to avoid similar accidents.

Data covering all operations of the reporting gas utilities as well as the gas departments of combination companies were used in calculating the various rates. Information pertaining to combination companies which did not report separately on their gas accident experience was excluded.[1]

[1] The figures on disabling injuries and days charged (and lost) pertain, of course, to accidents which occurred in activities related to employment in the gas utility industry. The accident rates are computed according to standard methods prescribed by the American Standards Association.

TABLE 1.—ACCIDENT EXPERIENCE OF THE GAS UTILITY INDUSTRY IN THE UNITED STATES, 1935–1944*

Year	Number of reporting companies	Number of deaths and permanent total disabilities	Total number of disabling injuries	Total days charged due to disabling injuries	Frequency Rates: Number of disabling injuries per 1,000,000 hours worked	Frequency Rates: Number of disabling injuries per 100 employees	Severity Rates: Number of days charged due to disabling injuries per 1,000 hours worked	Severity Rates: Number of days charged due to disabling injuries per 100 employees
1935	458	31	3,073	290,017	13.8	2.90	1.30	273.9
1936	457	30	3,616	288,378	15.4	3.28	1.23	262.0
1937	480	24	3,348	225,698	13.8	2.93	0.93	197.7
1938	446	23	2,825	223,114	12.0	2.51	0.94	198.1
1939	433	16	3,099	175,739	12.7	2.62	0.72	148.7
1940	449	36	3,429	316,436	13.8	2.83	1.27	260.8
1941	456	22½	3,210½	212,575	13.6	2.74	0.90	181.1
1942	439	29	2,983	259,919	13.9	2.88	1.21	250.6
1943	416	19	2,624	198,146	13.1	2.80	0.99	211.6
1944	403	24	2,847½	229,788	14.2	3.10	1.15	250.1

*The data cover all operations of reporting gas utilities and gas department operations of combination companies
Source: Reports from utilities to the American Gas Association

Total Industry Accident Rates

The gas utility industry in the United States experienced 14.2 disabling injuries per 1,000,000 man-hours of exposure in 1944, a frequency rate which was 8.4 percent higher than the rate of 13.1 injuries in 1943. The industry had 3.10 disabling injuries per 100 employees, an increase of 10.7 percent over the corresponding rate of 2.80 injuries the year before. These frequency rates are the highest the industry has experienced since 1936. (See Table 1.)

Comparison of the industry's 1944 severity rates with those for 1943 reveals even larger relative increases. In 1944 there were 1.15 days charged to disabling injuries per 1,000 hours of exposure as against 0.99 days in 1943, representing an increase of 16.2 percent. The number of days charged in 1944 for every 100 employees was 18.2 percent greater than in the preceding year.

The 1944 rates are based on reports covering more than 400 gas utilities. The reporting utilities employed an average of approximately 92,000 persons who worked 200.5 million hours during the year and had more than 2,800 disabling injuries, of which 24 were deaths or permanent total disabilities. Nearly 230,000 days were lost (or charged) as a result of these injuries.

The higher rates characterizing the accident experience of the total industry in 1944 reverse the favorable

TABLE 2.—ACCIDENT EXPERIENCE OF THE GAS UTILITY INDUSTRY IN THE UNITED STATES, 1935–1944, BY BRANCH*

Year	Number of reporting companies	Number of deaths and permanent total disabilities	Total number of disabling injuries	Total days charged due to disabling injuries	Frequency Rates: Number of disabling injuries per 1,000,000 hours worked	Frequency Rates: Number of disabling injuries per 100 employees	Severity Rates: Number of days charged due to disabling injuries per 1,000 hours worked	Severity Rates: Number of days charged due to disabling injuries per 100 employees
MANUFACTURED AND MIXED GAS UTILITIES								
1935	252	14	1,610	134,663	12.0	2.52	1.00	210.4
1936	258	14	1,973	128,194	14.1	3.03	0.92	196.9
1937	268	13	1,687	114,108	12.7	2.67	0.86	180.9
1938	240	5	1,343	62,837	10.9	2.28	0.51	106.6
1939	230	8	1,512	81,290	12.2	2.52	0.65	135.6
1940	232	17	1,658	148,768	13.5	2.76	1.21	247.4
1941	240	13	1,569	115,977	14.0	2.83	1.04	209.0
1942	222	10	1,725	102,747	16.5	3.47	0.98	206.8
1943	205	10	1,478	106,939	17.3	3.66	1.25	265.1
1944	188	12	1,598½	119,697½	17.7	3.83	1.33	286.6
NATURAL GAS UTILITIES								
1935	206	17	1,463	155,354	16.6	3.49	1.77	371.1
1936	199	16	1,643	160,184	17.3	3.65	1.68	356.2
1937	212	11	1,661	111,590	15.2	3.25	1.02	218.5
1938	206	18	1,482	160,277	13.1	2.76	1.42	298.5
1939	203	8	1,587	94,449	13.3	2.73	0.79	162.3
1940	217	19	1,771	167.668	14.1	2.89	1.33	274.0
1941	216	9½	1,641½	96,598	13.2	2.65	0.78	156.2
1942	217	19	1,258	157,172	11.4	2.33	1.43	291.0
1943	211	9	1,146	91,207	10.0	2.15	0.80	171.1
1944	215	12	1,249	110,090½	11.3	2.49	1.00	219.8

*The data cover all operations of reporting gas utilities and gas department operations of combination companie
Source: Reports from utilities to the American Gas Association

changes which were noted in the 1943 report. The 1944 rates, in general, are higher than those for 1942 or are at approximately the same levels. Total industry accident rates have fluctuated somewhat irregularly during the past six years, and there is no indication, accordingly, of a trend toward lower or higher rates in this period.

There were many inexperienced employees in the labor force of the industry in 1944. In reports from some individual gas utilities, higher accident rates in 1944 were attributed mainly to this factor.

Accident Rates by Branch of Industry

Changes in the composite accident rates of the industry between 1943 and 1944 mask rather striking differences between manufactured and mixed gas utilities and natural gas utilities with respect to relative changes in accident rates in those years.[2] In the manufactured branch, for instance, there was a fairly moderate increase of 2.3 percent in the number of disabling injuries per 1,000,000 man-hours of exposure—from 17.3 in 1943 to 17.7 in 1944. The corresponding frequency rate for natural gas utilities increased by 13.0 percent over the rate for 1943. The summary above shows *percent changes* between the two years in the accident rates of the two branches of the industry and of the total industry.

Base	*Manufactured Gas Utilities*	*Natural Gas Utilities*	*Total Gas Utility Industry*
	FREQUENCY RATES		
Per 1,000,000 man-hours of exposure	+2.3%	+13.0%	+ 8.4%
Per 100 employees	+4.6	+15.8	+10.7
	SEVERITY RATES		
Per 1,000 man-hours of exposure	+6.4	+25.0	+16.2
Per 100 employees	+8.1	+28.5	+18.2

Despite these sharper *relative increases* in the accident rates of natural gas utilities, we find that when rates for 1944 are considered as absolute values, those of the manufactured branch of the industry were all substantially higher than the natural gas rates. The accident rates of the manufactured segment of the industry generally have been higher than the rates of the natural gas companies in the period from 1941 through 1944.

Thus the 1944 frequency rates, calculated on the basis of 1,000,000 hours of exposure, were 17.7 disabling injuries in the manufactured gas branch as against 11.3 for natural gas utilities. There were 3.83 disabling injuries for every 100 employees of manufactured gas companies but only 2.49 injuries in the natural gas division of the industry. (See Table 2.)

Severity rates in terms of 1,000 man-hours of exposure were 1.33 days for manufactured utilities as compared with 1.00 for natural gas companies; the corresponding severity rates per 100 employees were 286.6 and 219.8 days.

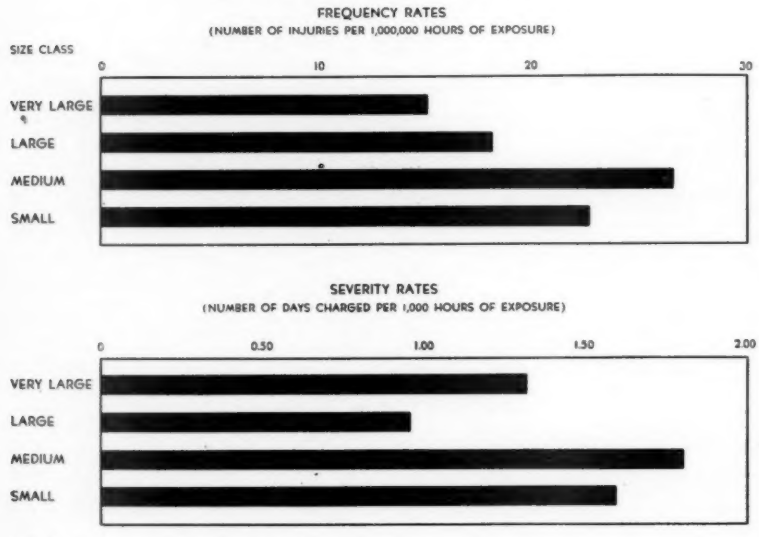
Accident Rates by Size of Utilities

The larger units in the manufactured branch of the gas utility industry enjoyed a more favorable accident experience than smaller companies in 1944. Among natural gas utilities, by contrast, the smallest units had the lowest frequency and severity rates. These facts are brought out in a new fourfold classification of utilities, based on total man-hours of exposure during the year, which was introduced for the first time in the 1944 accident report and which is incorporated in Table 3. The new classification and the precise meanings of its general terms, used to denote utilities of specific sizes, are shown in the following summary:[3]

Very large units—
1,680,000 hours and over

Large units—
540,000 to 1,679,999 hours

CHART I.—ACCIDENT RATES OF MANUFACTURED GAS UTILITIES, BY SIZE OF COMPANY, 1944



Source: Reports from utilities to the American Gas Association.

[2] The term manufactured gas utilities (or manufactured gas branch) is used hereafter, for ease of reference, to designate both manufactured and mixed gas utilities, for which combined accident rates are shown here. Accident data for these two types of gas utilities also were combined in computing the rates for the manufactured gas industry shown in reports for previous years.

[3] This classification is an effort to reconcile the method used in making safety awards by the National Safety Council, which employs three size classes based on monthly man-hours of exposure, with the practice of the American Gas Association of offering a special safety award for which only small companies are eligible. A small company is defined for this purpose as one with less than 100 employees. The Accident Prevention Committee of the Association considers this particular class of companies to be subject to greater accident risks than larger utilities.

When medium and small units, as defined above, are treated as one class our size classification is approximately the same as that used by the National Safety Council.

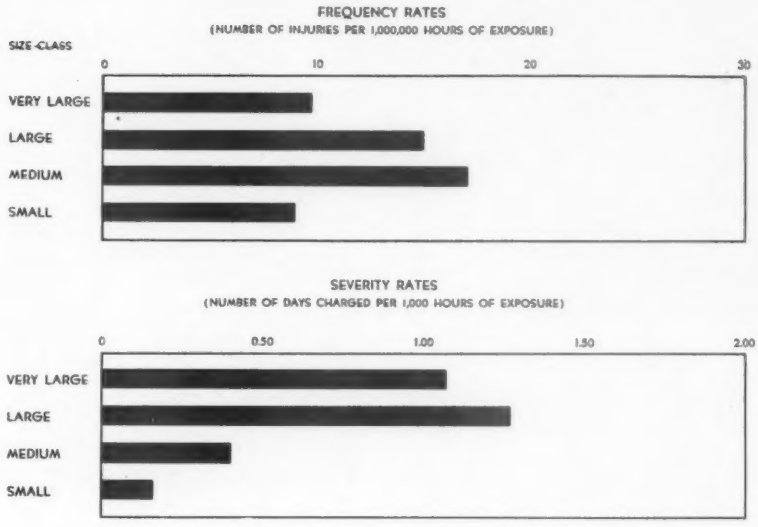
Medium units—
240,000 to 539,999 hours
Small units—
Under 240,000 hours

The new classification also may be described in terms of numbers of employees. If 2,400 man-hours of exposure per year be taken as an arbitrary equivalent of one worker, the classification may be expressed in numbers of full-time employees with these approximations:

Very large units—
700 employees and over
Large units—
225 to 699 employees
Medium units—
100 to 224 employees
Small units—
Under 100 employees

Table 3 shows that among manufactured gas utilities the very large companies had the lowest frequency rate—15.23 injuries per 1,000,000 hours of exposure—while the medium companies had the highest frequency rate—26.64 injuries. (See Chart 1.) The frequency rate of the medium and small utilities combined was 24.88 disabling injuries. Taking this combined rate into account, there appears to be an inverse relationship between size of company and magnitude of frequency rate. A similar regular pattern is not evident, however, in the severity rates of the different classes, although the combined rate for medium and small companies was higher than rates for the two classes of larger utilities.

CHART 2.—ACCIDENT RATES OF NATURAL GAS UTILITIES, BY SIZE OF COMPANY, 1944



Source: Reports from utilities to the American Gas Association.

In the natural gas division the outstanding fact is the comparatively more favorable accident experience of the small companies in 1944, as shown in Chart 2. The low frequency rate of this group (8.95 disabling injuries) was approached only by the very large utilities (9.73 injuries). Large and medium units had appreciably higher frequency rates. Small natural gas utilities had the extremely low severity rate of 0.16 days charged for every 1,000 hours of exposure. The severity rate of the large units was eight times as high as that of the small companies.

It should be noted that the size classification employed here (and in Statistical Bulletin No. 57) is quite different from that followed in previous reports on the accident experience of the industry in which the classification was designed only to place approximately equal *numbers of companies* in each class. The data shown in table 3 for various groups of utilities are not comparable, therefore, with data in previous bulletins for groups similarly labeled. The new groupings clearly form a more logical basis for comparing accident rates than the method used previously.

TABLE 3.—ACCIDENT EXPERIENCE OF THE GAS UTILITY INDUSTRY IN THE UNITED STATES IN 1944, BY BRANCH AND BY SIZE OF COMPANIES*

Size classification of companies	Number of reporting companies	Average number of employees during 1944	Total number of hours worked by employees during 1944	Number of deaths and permanent total disabilities	Total number of disabling injuries	Total days charged due to disabling injuries	Rates: Frequency (Number of injuries per 1,000,000 hours worked)	Rates: Severity (Number of days charged per 1,000 hours worked)
MANUFACTURED AND MIXED GAS UTILITIES								
TOTAL	188	41,765	90,267,816	12	1,598½	119,697½	17.71	1.33
Very large	14	26,170	55,362,915	8	843	72,898½	15.23	1.32
Large	20	7,623	16,998,923	1	310	16,257	18.24	0.96
Medium	28	4,417	9,984,142	2	266	17,945½	26.64	1.80
Small	126	3,555	7,921,836	1	179½	12,596½	22.66	1.59
TOTAL—Medium and small	154	7,972	17,905,978	3	445½	30,542	24.88	1.71
NATURAL GAS UTILITIES								
TOTAL	215	50,098	110,214,181	12	1,249	110,090½	11.33	1.00
Very large	18	33,173	73,496,028	8	715	78,411½	9.73	1.07
Large	23	9,731	21,205,525	4	318	26,963	15.00	1.27
Medium	24	4,385	9,482,272	0	162	3,754½	17.08	0.40
Small	150	2,809	6,030,356	0	54	961½	8.95	0.16
TOTAL—Medium and small	174	7,194	15,512,628	0	216	4,716	13.92	0.30

*The data cover all operations of reporting gas utilities and gas department operations of combination companies
Source: Reports from utilities to the American Gas Association

Coverage of the Accident Reports

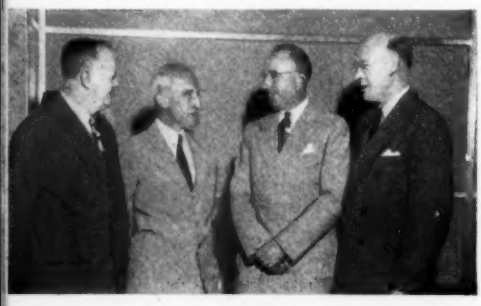
The 1944 total industry rates were based on usable accident reports from 403 gas utilities which employ an estimated 81 percent of the workers in the industry. Approximately 79 percent of the employees of manufactured gas utilities were covered in the reports from which branch rates were computed. The rates of natural gas utilities were based on an estimated coverage of 83 percent of the labor force in that section of the industry.

The natural *(Continued on page 471)*

Forward Honored

FOLLOWING announcement last month of the retirement of Alexander Forward after 22 years as executive head of the American Gas Association, tributes such as few in the gas industry have ever received poured in from all parts of the country. Mr. Forward's record of achievement in welding together a strong, efficient national organization which is now at an all-time peak of activity and accomplishment was hailed on all sides.

He was the guest of honor at three dinners at which his colleagues reviewed his outstanding contributions. The Executive Board of the American Gas Association gave the first dinner at the Waldorf Astoria, New York, on September 11. *(Picture above)* The following night, in the same setting, Mr. Forward was honored at a dinner for the "Old Guard" of the industry sponsored by Clifford E. Paige, president of The Brooklyn Union Gas Company and a past president of the Association. A feature of this event was the presentation of letters of appreciation by 22 of his early associates and friends. On the third occasion, the board of directors of the Association of Gas Appliance and Equipment Manufacturers gathered at the Ritz Carlton on September 13 to pay their respects to the retiring managing director.



Association Officers gathered at the Executive Board Dinner to pay tribute to retiring Managing Director Forward. Left to right: Vice-President Hargrove, Mr. Forward, President Robinson, and Vice-President Boothby

The regret of the Executive Board at the resignation of Mr. Forward was expressed in a resolution unanimously adopted on September 12. It said in part:

"In 1923 Major Forward was appointed secretary-manager of this Association and brought to his new position a splendid record of achievement as a well-loved and highly esteemed newspaperman, editor, military officer and public official of the State of Virginia and of the federal government. He guided the Association through its reorganization period with unusual foresight and ability, and in 1927 was appointed managing director.

"During his twenty-two years of service, Major Forward has administered the affairs of the Association with unfailing loyalty, high efficiency and steadfast perseverance, and has, through his wise counsel, keen vision and fine understanding, exerted a continuously constructive influence in the deliberations of this and its predecessor Boards. On the occasion of his retirement the entire gas industry pays high honor and tribute to Major Forward for the leading part which he has had in the development of the influence and activities of the American Gas Association for the betterment and advancement of the industry.

"The contribution which Major Forward has made in the management of this Association goes far beyond the performance of his official duties. It includes those qualities of character and personality which have won for him as a man the admiration, respect and affection of his associates and of all members of the gas industry. His devotion to duty, high sense of justice, quiet dignity and personal integrity stand as an example to all, and his innate courtesy and constant consideration for others make him a delightful companion and cherished friend. He has inspired all those with whom he has come in contact with the highest principles of business and personal conduct, and has rendered invaluable service to individual members of the Association through his personal help and advice."

Among the many messages received by Mr. Forward, the following are typical:

Tributes from A. G. A. Past Presidents

You achieved the highest type of cooperative relationship with which I have come in contact—*Ernest R. Acker.* . . . Congratulations on your valuable services to the gas industry!—*Dana D. Barnum.* . . . You have done a grand job for the industry—*Walter C. Beckjord.* . . . When I turned that task (the managing directorship) over to you I thought I had done a rather good job, but it was not long before I realized that you were doing a vastly better one—*Oscar H. Fogg.* . . . As usual, you seem to get the pole and with it lead the race—*Ralph W. Gallagher.* . . . The A. G. A. will never seem quite the same without your guiding hand—*George S. Hawley.* . . . Under your guidance the Association has developed into one of the most successful trade associations in the country—*John B. Klumpp.* . . . You have successfully directed, guided, and administered the projections from "many men of many minds" without ever getting in anybody's hair—*Bernard J. Mullaney.* . . . Through all the currents and cross currents of opinion and ideas, you have held the good ship A.G.A. steady on its course. When the long roll of those who have advanced our industry well is called, your name will be near the top—*Clifford E. Paige.* . . . The A. G. A. has for years been the envy of the electrical boys and you are the one who made it so—*Herman Russell.* . . . What a real asset your serv-

ices have been to the American Gas Association throughout these years—*Thomas J. Strickler.* . . . You have made the work of the Presidents a pleasure instead of a burden —*Percy S. Young.*

Commendation from Others

The industry appreciates the debt it owes for such capable leadership during a difficult era—*H. O. Andrew.* . . . You will be missed greatly by your host of friends—*F. C. Armbruster.* . . . The industry's progress and achievements during your tenure is a sure indication that it is very much alive. It is facing a grand future—*S. J. Beale.* . . . The splendid organization of the present A. G. A. is a monument to you—*A. M. Beebee.* . . . "Forward" your motto as likewise your name—*Charles E. Bennett.*

Much that our industry stands for and has accomplished has been due to your efforts—*Everett J. Boothby.* . . . Your position for many years put you in the front row of seats and your initiative, intelligence, honesty, and forthrightness inspired confidence and reflected credit on the industry—*James A. Brown.* . . . Your understanding and sympathetic attention to the needs of the Association, its members and the industry has largely contributed to its success and value—*Walter S. Byrne.* . . . It will be indeed strange to not have you as a guiding spirit over the affairs of the Association—*A. C. Cherry.* . . . The influence of your guiding hand in the affairs of the Association will be long remembered with appreciation—*C. M. Cohn.* . . . I have never written to the American Gas Association or thought of it that I have not had a vivid mental picture of you—*F. C. Freeman.*

The Association grew from a small gangling affair to a big vital force in the gas industry. Its most progressive programs were engineered and sponsored by you—*N. Henry Gellert.* . . . To me as to many others, the organized gas industry has seemed to be pretty much a lengthened shadow of Major Forward—*G. Ketchum.* . . . You have done a splendid job for the gas industry—*O. L.*

(Continued on page 471)

Right—Camera highlights of a distinguished career. Pictures show Managing Director Forward, top to bottom: (1) In 1918 when he served as an officer in World War I. (2) In 1923 at his desk in A. G. A. headquarters, New York, shortly after his appointment as executive head of the Association. (3) In 1933 in Portland, Oregon, during a visit to the Portland Gas and Coke Co. (4) In 1937 at the International Gas Union in Paris, France. (5) In 1940 on the boardwalk at Atlantic City, N. J., during an A. G. A. annual convention. (6) In 1942 in New Orleans, La., at an A. G. A. Distribution Conference

A Pageant of Men and Events

LAST week in our Board room I looked around at the photographs of each President of the Association and did some reminiscing. What a pageant of men and events! Beginning shortly after a World War when Mr. Cortelyou was constantly stressing the urgent importance of reconstruction upon sane firm foundations, through the hectic days of the twenties, the long depression well into the thirties, the steady and inevitable trend toward a second World War, then the early defeats and discouragements, its blood, sweat and tears, its waste of human life and treasure and of the evidences of our civilization, and into final victory, make indeed a moving panorama.

Just as striking were the qualifications, personalities, and varying strength of our Presidents. Differing in equipment and training, differing in the nature and degree of the contributions they could make to the industry, differing in qualities of lovableness and the quirks of nature to which we are all subject, everyone had a marked contribution to make and made it. They had proven qualities of leadership before their election. We have never had a President who did not give his best and who did not stand firmly and loyally behind me and behind Headquarters staff.

The same thing may be said generally of those who have served as members of the Executive Board whether as officers or Directors or as Sectional Vice-Presidents. Their gifts have been varied and they have differed in the contributions they have been able to make. I have received from every one of them nothing but kind consideration and effective support. Anything I may have accomplished is due to them and to the intelligent loyal help I have at all times received from the members of Headquarters staff, and indeed fear I am receiving the credit for what they did.—ALEXANDER FORWARD (Excerpt from talk at Executive Board Dinner, September 11, 1945)

Economics of LP Gas Operation

Widespread interest in liquefied petroleum gases reflected in a timely study of operating details of sixteen companies, plus comparative manufactured gas data

C. George Segeler

BY C. GEORGE SEGELER

Utilization Engineer, American Gas Association

LIQUEFIED petroleum gases and the equipment for handling them are again available and, judging from the number of inquiries, interest in their use is widely expressed. It is no longer news that a number of manufactured gas companies are applying the flexibility of propane to meet their peak load and standby needs.

Smaller companies are asking about conversion from present methods to LP gas operation. Towns without gas service are looking over the possibilities. In view of such interest, a study of the economics of existing LP gas utility systems appeared to be in order.

Fears lest adequate supplies of propane might not be available seem to have been set at rest following statements by executives of leading producing companies in recent issues of the trade press. The position of the natural gas and oil industry bulwarks such opinion with strongest technical evidence and a tremendous expansion of the LP gas industry is considered likely.

LP Gas Operating Data

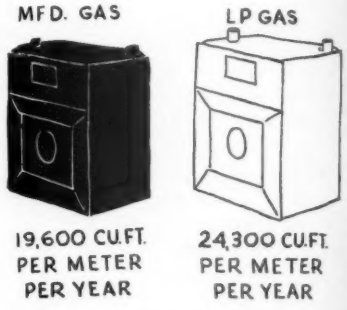
Since several hundred United States communities have long enjoyed LP gas service a comparative statistical study of operating results should be valuable to others who might be considering the use of these gases. Investigation soon showed that the necessary details would not be available in most cases since the reports were merged with those of larger utility companies and were not separately broken down in usable fashion. Fortunately, sixteen LP gas companies were able to give details of their sales, revenue, and financial results and these data serve as the basis for this study. These LP gas systems are distributed through sixteen states all over the United States thus affording a fair cross-section of what is being accomplished by this type of gas company. All data is on the basis of 1944 operations.

In all of the following tabulations, the sixteen companies are listed in the same order, namely, in decreasing order of total revenue per meter. This order has been selected because it tends to highlight the more successful operations and also shows that size alone is not a major criterion in LP gas success.

General Comparisons

Table I furnishes a general comparison of the sixteen companies. They range in size from systems serving a population of only 5,000 to those reaching more than 40,000 (Company 8 has a substantial increase due to summer residents). The gas production of the first thirteen companies is expressed in Mcf per year of butane-air gas (520-550 B.t.u. per cubic foot). Companies 14, 15 and 16 serve 800 and 900 and 1000 B.t.u. gas respectively, and consequently it seems desirable to express production and sales data in therms rather than Mcf. The fifth column shows the percent unaccounted-for and even a perfunctory glance will show that some of these systems are unusually tight; four of these companies report less than 1% unaccounted-for gas. It is, of course, true that these results are being obtained in relatively new all-welded systems. One company whose data are not included in the table boasts about an eight year record with 0% loss using an all-copper distribution system. But, in spite of these points it must be acknowledged that the LP gas operator is most critical of high unaccounted-for figures. This is due, in part, to the higher cost of lost gas, but is also a reflection of attitudes and training. Since some of these sixteen systems were converted from manufactured gas, much higher unaccounted-for might have been anticipated. Apparently alert to the problem, leakage has been persistently attacked and steadily reduced using several novel methods which have been introduced by LP gas engineers. It is reasonable to conclude that one need not fear excessively high unaccounted-for after converting if proper steps are taken.

Columns 6 through 9 in Table I show the number of meters in operation. These data are further subdivided as to domestic, house heating, and industrial and commercial meters (in the case of Company 8 the number of domestic meters represents the annual average). Attention is drawn to



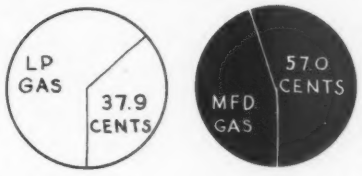
the relatively high number of house heating meters on the lines of such small companies. To be sure, these are not necessarily all year round central heating installations but they serve to indicate the aggressive sales policies of LP gas companies. Column 8 shows the number of industrial and commercial meters. The percentage, 13% for the entire group of properties, is markedly higher than would be anticipated for a similar group of small manufactured gas systems. It is prob-

able that this high figure contributes materially to the success of these companies and reflects the need for a modern, convenient, reliable automatic fuel for commercial establishments and small industries. Most of these companies have established attractive gas rates which have enabled them to secure and hold this business. They are effectively meeting oil and electric competition.

Column 10 lists the ratio of the population to the total of domestic and house heating meters. As might be anticipated from the characteristics of small towns, houses are spread out over considerable area and quite a few of them are not using gas service. As a result the ratio of population to meters is rather high and varies over wide limits.

While this fact tends to increase the

PAYROLL PER MCF OF GAS SOLD



cost of distributing gas, it also often points the way to future growth by adding additional meters to existing lines.

Sales and Revenues

Table II covers the sales and revenue data for sixteen LP gas systems listed in order of decreasing revenue per meter, as shown in column 9. Companies 14, 15 and 16 are separated because they are on a therm basis. Excluding the latter, the highest revenue per meter was $61 and the lowest $31. In a general way, the revenue from domestic meters follows the same order but there is sufficient departure to justify careful study of the influence of the average domestic rate, as shown in column 10, and the sales per meter, given in columns 2-5. Without attempting to analyze the background of companies having high rates, it is apparent that this has definitely influenced domestic sales results. Nevertheless, this line of reasoning should not be pursued too far since it is also obvious that the revenue per domestic meter does not follow the revenue per Mcf in any recognizable pattern. Note, for example, that Company 9, with a revenue of $2.51 per Mcf, had practically the same revenue per meter as Company 13, with a revenue per Mcf about half as high. It would be necessary to know more about the character of the area and the aggressiveness of the sales effort before reaching a positive conclusion on these apparent anomalies.

In a general way, high revenues per industrial and commercial meter parallel good results in domestic sales, and later this will be correlated with the financial ratios.

TABLE I—GENERAL COMPARISON OF L.P. GAS-AIR SYSTEMS 1944

1	2	3	4	5	6	7	8	9	10
	Popula-		Unac-			No. of Meters			Ratio of Population to Domestic and House Heating Meters
Co. No.	tion Served	Total Gas Produced	counted for	% Unaccounted	Domestic	House Htg.	Ind. & Comm.	Total	
			MCF	MCF					
1	10,243	35,434	286	0.8	472	91	82	645	15.8
2	5,381	24,162	—	—	461	12	72	545	11.4
3	47,526	125,932	10,833	8.6	1,980	206	293	2,479	21.7
4	7,636	27,285	123	0.5	427	81	53	561	15.0
5	12,000	13,675	—	—	234	0	67	301	58.3
6	18,000	62,747	4,756	7.5	1,126	0	157	1,283	6.1
7	13,095	72,544	2,904	4.0	1,594	11	152	1,757	8.2
8	40,000	202,131	19,243	9.5	3,794	408	1,054	5,256	7.7
9	5,161	17,826	5,110	28.6	410	9	67	486	12.3
10	22,631	42,496	5,019	11.8	1,195	94	129	1,418	16.0
11	5,700	19,500	175	0.9	526	0	45	571	10.8
12	7,200	24,811	3,937	15.8	807	0	92	899	8.0
13	6,000	18,062	178	0.9	589	0	68	657	10.9
	The following companies serve 1000, 800 and 900 B.t.u. gas respectively and therefore the production and sales data has been expressed in therms.								
		Therms	Therms						
14	40,000	1,742,650	156,220	8.9	4,180	0	7	4,187	9.6
15	10,548	190,000	60,000	31.6	438	0	115	535	24.0
16	25,089	386,442	77,604	20.0	1,969	0	221	2,190	12.7

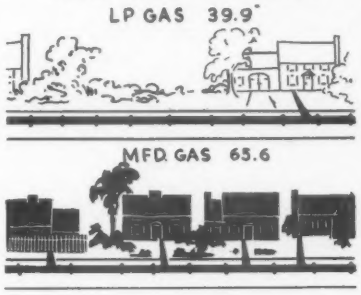
Notes:
1. Compare low % unaccounted with typical gas industry data.
2. Industrial and commercial meters represent 13% of total meters for these companies contrasted with 4% for manufactured gas industry.
3. Data for the first 13 companies are on basis of 530 B.t.u. butane-air gas.

TABLE II—SALES AND REVENUE DATA

1	2	3	4	5	6	7	8	9	10
	Sales per meter				Revenue per meter				
Co. No.	Domestic Cu. Ft.	House Htg. Cu. Ft.	Ind. & Comm. Cu. Ft.	Total Cu. Ft.	Domestic	House Htg.	Ind. & Comm.	Total	Average Domestic Revenue per MCF
1	36,100	23,800	193,500	54,500	$49.70	$18.50	$174.00	$61.00	$1.38
2	27,700	130,000	130,000	43,600	44.00	99.30	124.00	55.60	1.58
3	31,400	46,200	136,500	45,000	45.80	37.00	130.50	55.20	1.46
4	32,400	59,000	151,000	47,400	46.00	44.80	136.50	54.40	1.42
5	26,000	—	113,000	45,400	34.80	—	117.50	53.10	1.34
6	33,500	—	123,000	44,300	41.40	—	152.50	51.30	1.23
7	27,600	194,000	140,000	38,400	41.30	148.00	129.00	49.60	1.50
8	10,400	179,000	60,000	34,000	29.15	127.50	90.30	49.00	2.91
9	11,300	27,500	114,300	26,100	28.40	30.80	161.20	45.50	2.51
10	15,800	73,500	75,300	25,200	31.40	89.60	82.00	40.00	1.98
11	22,800	—	126,000	30,900	32.50	—	98.70	37.70	1.42
12	17,500	—	67,500	22,600	27.30	—	77.70	32.50	1.56
13	23,600	—	52,500	26,600	28.10	—	55.00	31.00	1.19
	Sales data in therms per meter for the following three companies								
14	370	—	3,200	376	63.20	—	344.00	63.70	.17 per therm
15	116	—	688	235	35.00	—	145.00	58.00	.30 " "
16	91	—	540	177	30.00	—	111.60	38.10	.33 " "

Notes:
1. Compare data in column 9 with financial results in columns 5 and 6 in Table 7.
2. Revenue per meter of more successful companies well above manufactured gas industry averages. Average of sixteen companies is $48.48 compared to $41.93 for similar manufactured gas systems.

METERS PER MILE OF MAIN



The statistical data naturally does not reveal the underlying reasons which produce the difference between the best and lowest results. The average amount of domestic gas sold by small manufactured gas companies is 19,600 cubic feet per customer per year. The average of the thirteen LP gas utilities for which this data is available is 24,300 cubic feet. It is self-evident that the argument may be raised that this small group of companies is not representative, and that

therefore no conclusions should be drawn. It is nevertheless true that the first seven companies in the list show rather good domestic sales results measured against conventional manufactured gas industry yardsticks. Of these first seven companies, four are located in the south and three are strung out from the Great Lakes to the West coast. Unfortunately, no appliance saturation figures are available, but the results of the more successful companies seem to indicate that automatic water heaters and refrigerators had been actively promoted with resultant improvement in the sales picture.

Customers Per Mile of Main

Table III deserves momentary attention since it indicates the extent of the distribution systems in these small properties. As can be observed, they range between a density of 90 meters per mile of main and a low of 12. Viewed from the background of large metropolitan utilities, such low meter figures are most unusual. However, there appears to be no correlation between the density of customers and the sales or revenue data. This density is simply the result of the character of the community. Unless unusual growth factors should enter the picture, no substantial change in this data should be anticipated except where the ratio of population to customers is high.

Table IV is devoted to the unit cost data and is based on questionnaires furnished to the American Gas Association. Column 2 shows the total or gross investment in gas utility plant exclusive of depreciation or retirement reserves. By dividing items in column 2 by the number of meters it is possible to obtain a rough investment unit figure which includes all of the ele-

TABLE III

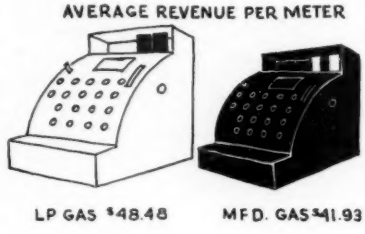
Meters Per Mile of Main

Co. No.	*Meters*	*Co. No.*	*Meters*
1	31.8	9	40.6
2	22.6	10	33.0
3	26.3	11	40.8
4	32.0	12	59.0
5	12.0	13	63.0
6	52.7	14	91.0
7	42.6	15	24.8
8	26.0	16	—

TABLE IV—UNIT COST DATA

1	2	3	4	5	6	7	8
No.	*Total Investment Gas Utility Plant*	*Total Gas Utility Plant Per Meter*	*Operating Expenses*	*Payroll*	*Operating Exp. Exclusive of Payroll*	*Operating Exp. Per M.C.F. Sold*	*Operating Exp. Exclusive Payroll Per M.C.F. Sold*
1	$101,795	$158	$22,380	$12,676	$9,704	$.64	$.29
2	83,344	153	17,587	7,214	10,373	.74	.44
3	284,130	115	89,600	35,328	54,272	.80	.49
4	90,086	160	19,069	9,732	9,337	.72	.35
5	203,205	675	14,250	3,244	11,006	1.04	.81
6	—	—	—	—	—	—	—
7	210,895	120	52,816	20,815	32,001	.78	.48
8	1,400,000	266	168,482	79,112	89,370	.96	.51
9	78,650	161	17,775	6,980	10,795	1.40	.85
10	298,288	210	42,879	25,520	17,359	1.20	.47
11	1,676,483	—	11,948	3,510	8,438	.68	.48
12	NOT AVAILABLE						
13	" "						
14	" "						
15	" "						
16	" "						

ments of the system; production, distribution, etc. These unit figures (column 3) vary widely, including some which may be in the process of writing off an older manufactured gas plant. Operating expenses exclusive of depreciation or taxes are shown in column 4, and payroll including officers' salaries in column 5. The purpose of separating these items was in order to indicate the influence of payroll on this type of gas production. The data developed in these three columns was then used to compute the operating expenses per Mcf of gas sold, both including and excluding payroll. The average operating expense per Mcf of gas sold was $.90.



The last two columns (column 7 and column 8) disclose some interesting possibilities when studied together. In the first place, the lower operating expenses have been reported by companies having the best sales and revenue records. Secondly, the difference between the two columns is the payroll expense per Mcf of gas sold, and it stays pretty much between 30 and 27¢ for the first seven companies. Companies 8, 9 and 10 respectively have a payroll of 45, 55 and 73¢ per Mcf. These expenses are considerably higher and may be a contributing factor in the higher rates charged by these three companies. As had already been pointed out, there is some relation between these rates and the lower revenues per customer which these three companies obtain. On the basis of this limited study, it would appear as though payroll should be not in excess of 35¢ per Mcf of gas sold.

Number of Employees

As a further basis for considering these costs, Table V might be reviewed. This gives the number of employees per hundred meters, including officers. The data shows no apparent consistency and apparently no relation to the other statistical data reviewed thus far. Average pay rates in the LP gas systems are in line with utility pay schedules in similar sized communities.

TABLE V

No. Employees per 100 Meters (Inc. Officers)

Co. No.	*Employees*
1	1.70
2	1.46
3	1.12
4	2.66
5	1.07
6	.70
7	.74
8	.58
9	1.02
10	1.26
11	.56
12	.56
13	.46
14	.38
15	.90
16	—

Cost of Fuel

Since the cost of liquefied petroleum products used for making gas is a major element in operating expense, the unit data has been given in Table VI. The differences in price per gallon paid by the various companies are largely, though not entirely, due to the differences in freight cost. They are reflected with reasonable accuracy in the operating expense per Mcf, exclusive of payroll, shown in column 8 of Table IV Companies 1 and 4, as shown in Table IV, have outstandingly low operating expense, although they did not pay the lowest prices for their raw materials. Those companies using butane with 101,000 B.t.u. per gallon make 190 cubic feet of 530 B.t.u. gas from each gallon of fuel. Therefore, 5.26 x the price paid per gallon is the basic raw material cost per Mcf exclusive of losses and use by the utility itself.

Economics of LP Gas Systems

The problem of evaluating how profitable it would be for any given manufactured gas system to convert to LP gas operation can not be solved in general terms. Local circumstances control the basic factors on which profit margins will be determined. These sixteen LP gas systems do give an overall picture of what has been accomplished and thus lend encouragement to those who would go and do likewise. The operating expenses per Mcf of some of these companies are definitely and substantially lower than those of similar sized manufactured gas properties because of lower fixed and labor charges even in cases where fuel cost comparisons show no marked advantage for LP gas service.

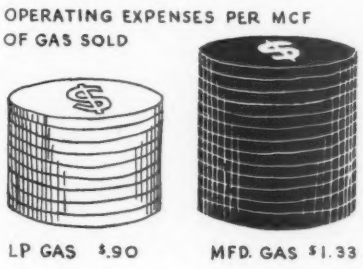
TABLE VI
Fuel Data

Co. No.	*Price Per Gallon 1944*
1	.054
2	.058
3	.052
4	.057
5	—
6	.073
7	.053
8	.066
9	.083
10	.048
11	.044
12	.062
13	.064
14	—
15	.077
16	—

TABLE VII—FINANCIAL RATIOS 1944

1	2	3	4	5	6
Co. No.	*Annual Maintenance as percent of Gas Utility Plant* %	*Depreciation Reserve as percent of Gas Utility Plant* %	*Annual Depr. Exp. as percent of Gas Utility Plant* %	*Gross Income* as percent of Gas Utility Plant* %	*Gross Income* as percent of Net Gas Utility Plant* %
1	0.3	18.0	2.39	11.1	12.4
2	1.2	22.3	3.64	9.3	12.0
3	1.5	30.7	4.85	10.3	14.9
4	0.2	17.3	2.53	8.1	9.9
5	0.3	33.9	2.78	Loss 1.9	Loss 3.0
6	—	—	—	—	—
7	0.6	22.0	2.81	9.0	11.6
8	0.8	3.9	1.24	4.3	4.5
9	2.4	2.3	1.97	0.3	0.3
10	0.9	15.5	2.39	1.9	2.3
11	—	—	—	—	—
12	NOT AVAILABLE				
13	—				
14	—				
15	—				
16	—				

*Includes net from merchandising



The financial results of the operations of the companies included in this comparative study should therefore be of particular interest.

Examination of various financial ratios is most encouraging and paints a rather rosy picture for at least the more successful companies in the group. The indices used to measure financial results are shown in Table VII. Column 2 expresses the ratio between annual maintenance expense and the total investment in gas utility plant. This figure is generally low since much of the maintenance appears in other accounts and is therefore reflected in operating expenses but not separately tabulated under the heading, "Annual Maintenance." The amount is small in all cases and therefore is not expected to exert a major influence on earnings.

Column 3 sheds some light on the present financial position of these companies. It expresses the ratio between the depreciation or retirement reserve and the total investment in gas utility plant, for most of these properties, operations have been going on long enough that substantial reserves have been set up. In two cases, (Companies 8 and 9) the reserve appears to be unusually small.

The amount set up as depreciation and retirement reserve is perhaps of less interest than the data shown in column 4, which expresses the ratio of annual depreciation and retirement expense to the total investment in gas utility plant. These ratios fall between 1.24% and 4.85% per year, but all save the lowest, are approximately 2% or more. The average value is 2.74%.

Columns 5 and 6 have undoubtedly caught the eye from the start, for these show the ratio between gross income and total and net plant. The figure includes net income derived from merchandising activities. The results in general are excellent, and, in several cases are outstanding. Only one company shows an actual loss, and one other company is apparently operating at extremely low margins. There is a very definite relation between high ratios in these two columns and successful sales effort, as shown in Table II. Since this is the case, companies contemplating conversion to LP gas should carefully review the possibilities of increasing annual sales and revenues per meter. Studies would reveal what added sales potential could be tapped by strategic rate changes designed to take on added water heating, refrigeration and space

TABLE I (Mfd.)—GENERAL COMPARISON OF SMALL MANUFACTURED GAS SYSTEMS 1944

1	2	3	4	5	6	7	8	9	10
					No. of Meters				Ratio of Population to Domestic and House Heating Meters
Co. No.	Population Served	Total Gas Produced	Unaccounted for	% Unaccounted	Domestic	House Htd.	Ind. & Comm.	Total	
		M.C.F.	M.C.F.						
1	11,564	39,791	9,728	24.4	844	3	84	931	13.6
2	48,350	184,997	12,034	6.5	2,683	243	329	3,255	16.5
3	15,900	28,942	3,407	11.8	634	0	80	714	25.1
4	10,000	31,000	—	—	760	0	57	817	12.2
5	19,055	146,571	20,191	13.8	2,400	100	55	2,555	7.6
6	13,550	119,732	8,753	7.3	1,882	0	126	2,008	7.2
7	15,247	60,351	3,422	5.7	1,639	13	82	1,734	9.0
8	11,750	157,280	7,672	4.8	2,978	0	166	3,144	3.9
9	30,000	18,984	2,325	12.3	436	21	85	542	65.7
10	8,000	48,499	4,835	9.1	1,321	0	55	1,372	6.1
11	10,500	23,988	5,571	23.2	774	0	96	870	13.5
12	6,868	38,846	5,233	13.5	1,139	0	81	1,220	6.0
13	—	23,758	4,296	13.9	604	16	126	746	—
14	5,000	24,258	4,907	20.2	739	7	61	807	6.7
15	14,012	44,165	4,560	10.3	1,055	0	117	1,172	13.3
16	7,500	36,756	3,530	9.6	1,282	0	28	1,310	5.7
17	2,880	12,498	1,653	13.2	511	3	0	514	5.6
18	18,501	60,974	2,413	4.0	1,963	42	171	2,176	9.2
19	16,000	96,824	22,152	22.9	2,444	1	188	2,633	6.5
20	17,000	20,575	1,264	6.1	924	0	55	979	18.4
21	7,000	38,339	4,310	11.2	1,257	0	71	1,330	5.5
22	8,000	10,980	1,084	9.9	503	0	21	524	15.7
23	7,020	27,950	4,019	14.4	1,289	0	95	1,384	5.4
24	—	22,018	2,422	11.0	853	0	67	920	—
25	10 000	18,785	2,335	12.4	894	0	123	1,017	11.2
26	18,000	25,973	1,664	6.4	1,615	0	114	1,729	11.1
27	14,830	52,365	6,200	11.8	2,118	0	188	2,306	7.0
28	4,025	7,827	1,174	15.0	504	0	0	504	7.9
29	10,000	46,545	3,366	7.2	2,025	0	289	2,314	4.9
30	9,000	15,000	—	—	989	0	4	993	9.0

heating in the domestic field and increasing sales to commercial and industrial accounts, assuming sufficient trained sales and service forces to carry out this job effectively and promptly.

Since the companies included in this study generally served butane-air there was no possibility of increasing revenues through bottled gas sales. Today with butane no longer readily available, propane is likely to be the fuel used for piped gas service and that fact opens the road to an additional market. To a large extent this is already fully developed through hundreds of local dealers and agencies serving rural and suburban homes, farms, shops and kitchens. Past experience indicates that many utility companies have not been in a good position to enter this competitive (and non-franchise) field. On the other hand many such local dealers now have to truck their propane considerable distances from the nearest bulk fillingstation. The gas company may, in these instances, be able to sell the dealer propane by reason of the shorter truck haul. In other situations, the utility company may discover a profitable and untapped market for bottled gas awaiting development.

Propane service should also simplify the appliance problem for stores and plumber dealers since the same type of gas service would then be available in or out of town. This might readily result in considerable improvement in company merchandising activity.

The results here reported lend color to the growing opinion that LP gas service has excellent possibilities for the improvement of small manufactured gas systems particularly if the time is ripe for major capital investment for replacing manufacturing facilities that are approaching the end of their economic life.

A Comparison with Manufactured Gas Systems

Among small manufactured gas company managements there is widespread belief that LP gas operation would improve operating results and thus benefit the financial picture of the system. In order to test this opinion a comparison seemed in order between the 16 LP gas companies described thus far and a similar group of manufactured gas properties. In undertaking this comparison the first thought was to review the former manufactured gas history of the present LP gas group. This idea was abandoned for two reasons. In the first place much of the information was not available and in the second place, the changes caused by the passage of years would make such comparisons of little or no true value. A more desirable comparison seemed to be possible by selecting a group of similar small manufactured gas companies located near to the 16 LP gas systems. To a large extent this proved practical but in order to improve the reliability of the comparison the manufactured gas data used here includes all small manufactured gas company reports available to the A. G. A. Thirty companies of appropriate size furnished complete reports on which a study could be based.

The same indices which have been reported above for the LP gas systems

TABLE II (Mfd.)—SALES AND REVENUE DATA 1944

1	2	3	4	5	6	7	8	9	10
	Sales per meter					Revenue per meter			
Co. No.	Domestic Cu. Ft.	House Htg. Cu. Ft.	Ind. & Comm. Cu. Ft.	Total Cu. Ft.	Domestic	House Htg.	Ind. & Comm.	Total	Av. Dom. Revenue per M.C.F.
1	23,900	190,000	109,000	32,000	$53.50	$337	$243	$71.50	$2.23
2	20,200	194,000	197,000	53,000	37.40	153	210	64.21	1.80
3	25,500	0	148,000	39,400	48.00	0	163	60.00	1.87
4	31,500	0	141,000	39,200	52.80	0	140	60.00	1.67
5	36,800	252,700	230,000	49,500	—	—	—	58.20	—
6	24,300	0	353,000	43,500	33.40	0	285	56.54	1.37
7	19,000	606,000	219,000	32,800	39.00	438	245	52.20	2.05
8	19,400	0	555,000	47,500	30.40	0	386	49.51	1.58
9	19,700	121,000	62,000	30,500	35.50	104	100	48.41	1.81
10	21,900	0	267,000	31,800	36.00	0	250	44.50	1.64
11	17,200	0	53,200	21,100	39.70	0	91	45.20	2.32
12	24,000	0	76,500	27,500	41.00	0	84	43.20	1.73
13	19,700	80,000	48,700	25,800	34.50	66	75	42.20	1.75
14	17,700	83,500	81,000	23,000	33.50	84	118	40.30	1.90
15	21,500	0	135,000	33,800	26.00	0	156	39.00	1.17
16	20,700	0	230,000	25,400	35.40	0	225	39.50	1.72
17	18,900	300,000	0	20,600	37.70	315	0	39.40	2.00
18	17,000	280,000	77,500	26,800	31.30	185	95	39.30	1.83
19	17,700	790,000	156,000	27,800	30.30	398	140	38.50	1.71
20	15,800	0	85,000	19,700	32.90	0	110	37.20	2.09
21	20,100	0	117,000	25,300	32.40	0	118	37.00	1.61
22	8,600	0	266,000	18,800	22.00	0	327	34.10	2.59
23	15,000	0	46,700	17,300	27.80	0	64	30.40	1.85
24	—	—	—	21,200	—	—	—	31.70	—
25	16,400	0	14,200	16,100	30.40	0	254	29.80	1.90
26	10,100	0	69,500	14,000	24.00	0	103	29.60	2.41
27	16,500	0	60,000	20,000	25.00	0	57	27.70	1.53
28	15,500	0	0	15,500	26.40	0	0	26.40	1.69
29	—	—	—	18,500	—	—	—	23.90	1.30
30	14,300	0	72,000	14,300	18.10	0	109	18.40	1.27

TABLE III (Mfd)

Meters per Mile of Main

Co. No.	*Meters*
1	55.1
2	44.7
3	35.3
4	48.1
5	75.1
6	68.1
7	21.5
8	98.9
9	10.9
10	30.2
11	64.2
12	55.1
13	12.2
14	53.0
15	78.0
16	75.3
17	109.6
18	76.5
19	42.0
20	122.0
21	114.6
22	28.5
23	41.7
24	130.0
25	69.2
26	106.7
27	91.1
28	55.8
29	72.2
30	89.0

have been reviewed for these thirty manufactured gas properties. The overall conclusion indicates that the opinion so widely held is in general a valid one. Operating results of LP gas systems, even quite small systems, appear on the whole to be better than the results obtained in similar manufactured gas properties. In the case of LP gas operation the companies whose total revenue per meter exceeded $40 showed attractive financial ratios. While continuing adequate depreciation charge-offs such companies in general earned a good return on the gas utility plant investment. A high revenue per meter measured by conventional yardsticks offered excellent assurance of a high income ratio.

In the case of the manufactured gas systems, no such conclusion proved possible and although several of the companies in the manufactured gas group reported high revenue per meter —higher in several instances than the comparable LP gas companies—the ratio of gross income to gas utility plant was in general low. It also is of interest to take note of the small depreciation and retirement charge-offs in several instances.

The average revenue per meter obtained from the companies under consideration highlights this point; in the case of LP gas companies it amounted to $48.48 while it was $41.93 for the manufactured gas companies.

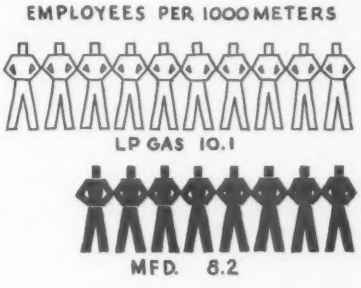
Examination of the other data in the tables covering manufactured gas companies and comparison with the corresponding data for LP gas companies is most illuminating. The tables have been numbered with the same numbers. In Table I (Mfd) several striking differences show up;

1. Domestic meters form a much bigger percentage of total meters and it is difficult to explain why this should be the case considering the similarity of the territories involved.

2. The ratio of population to number of meters is markedly lower indicating a higher degree of saturation of the area. This fact ought to be reflected in better income ratios since distribution costs are lowered through compact systems but other factors apparently offset this advantage. Table III (Mfd) showing the higher number of meters per mile of main (an average of 65.6 compared to 40 for LP gas) also leads to the same conclusion.

3. Unaccounted-for is relatively higher for the manufactured gas properties.

In Table II (Mfd) many differences are apparent at a glance. There is a much wider spread in sales and revenue data between the highest and lowest companies and the data does



not lend itself to any obvious correlation. Average results are markedly poorer for the manufactured gas systems than for the LP gas companies although individual cases may be favorably situated. A rather surprising point is the small total number of house heating and commercial accounts although the individual sales to such meters are rather high in several instances (Co. 7 & 19—house heating and Co. 8, commercial and industrial).

TABLE IV (Mfd.)—UNIT COST DATA 1944

1	2	3	4	5	6	7	8
Co. No.	*Total Investment Gas Utility Plant*	*Total Gas Utility Plant Per Meter*	*Operating Expenses*	*Payroll*	*Operating Exp. Exclusive of Payroll*	*Operating Exp. Per M.C.F. Sold*	*Operating Exp. Exclusive Payroll Per M.C.F. Sold*
1	$214,569	$230	$54,186	$22,815	$31,371	$1.81	$1.05
2	968,168	298	165,524	69,378	96,146	.95	.56
3	257,089	359	23,818	13,830	9,988	.85	.36
4	108,245	132	46,580	15,083	31,497	1.45	.98
CM 5	393,956	154	101,433	20,534	80,899	.91	.64
6	279,363	139	85,306	29,037	56,269	.77	.51
7	437,770	249	66,097	12,553	53,544 P	1.16	.94
8	402,583	128	129,537	37,516	92,021 Pa.	.87	.61
9	—	—	20,238	7,221	13,017	1.23	.79
10	275,210	200	56,249	22,876	33,373	1.29	.76
11	153,510	176	48,775	18,000	30,775	2.66	1.68
12	212,571	174	41,656	6,643	35,013 P	1.24	1.04
13	162,812	218	25,490	9,179	16,311	1.32	.84
14	163,403	203	26,617	5,239	21,378	1.50	1.15
CM 15	198,740	169	29,989	15,553	14,436	.69	.39
16	285,625	218	40,136	15,417	24,719	1.22	.74
17	82,110	159	16,155	6,898	9,257	1.50	.87
18	203,802	93	55,402	5,913	44,489 P	.95	.85
19	677,417	259	85,592	44,049	41,543	1.16	.56
20	195,679	299	29,784	14,161	15,623	1.55	.81
21	202,740	152	38,188	16,568	21,620	1.13	.64
22	233,896	446	16,855	6,354	10,501	1.77	1.06
23	355,736	257	37,925	11,504	26,421	1.58	1.10
M 24	51,213	56	26,545	12,266	14,279	1.36	.73
25	126,195	124	24,647	10,911	13,736	1.50	.83
26	214,441	124	36,938	18,995	17,943	1.52	.73
CM 27	235,136	102	48,620	19,032	29,588	1.05	.64
28	50,000	99	11,541	4,424	7,117	1.49	.89
M 29	258,984	112	50,756	26,303	24,453	1.19	.59
CM 30	127,042	127	17,283	5,165	12,118	1.21	.85

C—Combination
M—Municipal
Pa—Purchases part of the gas
P—Purchases all gas

The most striking indication is the difference in average revenue per meter for LP gas and manufactured systems already pointed out as well as the fact that high manufactured revenue per meter does not apparently lead to a high ratio of gross income to plant investment in the case of manufactured gas systems.

Table III shows the relatively high meter density resulting from an established history of good public service in a stable community.

A word of explanation is necessary in the case of Table IV (Mfd). Certain companies—No. 5, 15, 27 and 30—are combination municipal companies and were unable to furnish a satisfactory segregation of their payroll accounts. Therefore although payroll indices have been tabulated they have been omitted in the averages along with the records of companies buying rather than manufacturing gas. It seemed improper to consider cases of purchased gas in a study intended to look into the effect of manufacturing operations upon the system economy. Companies 7, 8, 12 and 18 were in this category. This still leaves twenty-two manufactured gas companies in the picture.

Notice the absence of any degree of correlation between revenue per meter and operating expenses per Mcf of gas sold. (Exclusive of taxes and depreciation). The average of the companies under consideration was $1.33 operating expense per Mcf of gas sold and this contrasts sharply with the figure of $0.90 obtained from Table IV (LP gas). The effect of payroll also is quite interesting. By subtracting the items in the last two columns it is possible to estimate the effect of payroll on the cost of gas. The average of the twenty-two companies serving manufactured gas is $0.57 per Mcf sold and is just 50% higher than payroll expense for the LP gas companies' $0.38 per Mcf sold.

TABLE V (Mfd)

No. Employees per 100 Meters (Inc. Officers)

Co. No.		Employees
1		1.18
2		1.04
3		1.12
4		1.22
CM 5		.54
6	P	.94
7	Pa	.40
8		.48
9		.92
10		.87
11		1.03
12	P	.50
13		.69
14		1.11
CM 15		1.39
16		.76
17		.97
18	P	.19
19		.79
20		1.02
21		.40
22		.76
23		.60
M 24		.87
25		.59
26		.52
CM 27		.13
28		.59
M 29		.60
CM 30		.10

More LP Gas Employees

But there is more to the story, than the self-evident fact that an LP gas plant does not need gas makers, purification labor, etc. because the records—Table V—show that the unexpected is true. The LP gas companies actually have more employees with an average of 1.01 employees per 100 meters compared to the manufactured gas systems with an average of 0.82 employees per 100 meters. It would be interesting to be able to analyze these differences in greater detail. One may surmise that the extra LP gas workers have been employed by the sales and service departments of their companies and that the result of their efforts shows up in the higher average Mcf sold and higher revenues. Discussion of this point with experienced operators confirms this conclusion and emphasizes the benefits of increased personnel. As a result such indices as payroll expenses per Mcf are favorable to LP gas operation as might be anticipated.

Fuel cost data shown in Table VI (Mfd) does not permit comparison with LP gas but has been tabulated to show the anticipated variations.

The favorable aspects of LP gas operation are further enhanced by the financial ratios computed in Table VII. The manufactured gas companies as a group make smaller provision for depreciation and retirement with an average of 1.83% compared to 2.74% for the LP gas companies. In the face of this larger depreciation and retirement expense, the income ratios might be expected to suffer, but surprisingly enough the reverse is true. Better income ratios indicative of higher net rates of return are reported by LP gas companies. An average figure could be computed to give a clue to the degree to which this is true but on account of the lack of uniformity with respect to depreciation and retirement expense and the absence of tax charges in the case of municipal companies, this figure would not furnish a valid picture. Inspection of the data, however, *(Continued on page 470)*

TABLE VI (Mfd)

Fuel Data 1944

Co. No.	Price per Gallon	Price per Ton
	Oil	Coal
1	.075	6.90
2	.074	8.48
3	.078	6.60
4	.071	11.00
5	.051	—
6	.059	6.36
7	—	—
8	.074	—
9	.078	—
10	.065	6.95
11	.072	9.73
12	—	—
13	.080	6.35
14	.080	—
15	.072	6.80
16	.053	—
17	.074	—
18	—	—
19	.056	5.91
20	.075	7.75
21	.079	—
22	.081	7.66 (generator) 3.48 (boiler)
23	.070	8.56
24	—	—
25	.068	—
26	.081	6.46
27	.066	7.94
28	.081	5.96
29	.068	9.68
30	.080	7.50

Jewels of Victory

How one of the world's largest consumers of manufactured gas —the optical industry—made a remarkable war contribution

BY LEO J. SULLIVAN

Rochester Gas & Electric Corp., Rochester, N. Y.

WORLD WAR II was, among other things, an optical war. Victory for our Armed Forces depended as certainly upon the availability and quality of optical glass as it did on gasoline, rubber and essential metals.

The biggest block-busters, the most destructive shells would be ineffective if they failed to find their targets.

Optical glass, and the instruments into which it is fitted, help to locate the targets so that bombardiers and gunners can obliterate them. Without this vital and strategic raw material, our Army, Navy and Air Force would have been powerless, and the United States would have been unable to fight a modern mechanized war. Optical glass is the lifeblood of the range finders and other fire control instruments which determine the accuracy of our big guns on land and sea. It is used in the photographic lenses and bomb sights which are vital to every bombing mission. It is the fundamental ingredient in binoculars, bubble sextants, flank spotting scopes, anti-aircraft height finders and a host of other military optical instruments. It is essential in the make-up of microscopes, spectrographs, metallographic cameras and other precision production instruments.

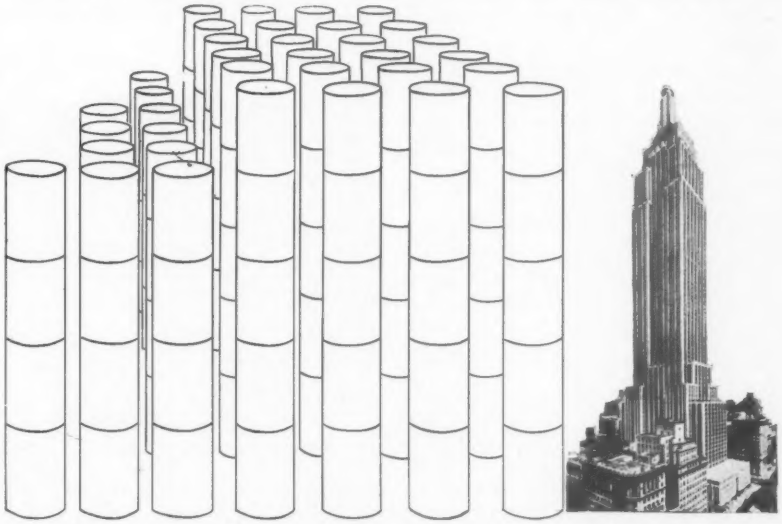
Although the phrase "optical glass" has appeared in the public and trade press from time to time, little has been printed of the qualities which serve to distinguish optical glass from other glasses. In general, it may be said that optical glass is the highest type of clear glass known in the art. Ordinary glass, in its conventional use, appears clear and white, but if you look through it edgewise, considerable color may usually be detected. For optical purposes, notably in the case of prisms used in range finders and periscopes, thicknesses as much as four or five inches are used and the glass must be absolutely clear and optically perfect.

The qualities assigned for test in establishing standards of inspection for optical glass include:

1. Uniform chemical composition and freedom from striation, bubbles, inclusions and crystallization.
2. Optical properties pertaining to the bending of rays of light, such as index of refraction and dispersion.
3. Freedom from color.
4. Physical and chemical stability.
5. Physical homogeneity freedom from strain or internal stresses caused by uneven cooling of the molten glass.

To produce glasses with these qualities the first obvious requirement is high chemical purity in all the ingredients of the glass itself and the second either an insoluble pot in which to melt it, or one in which the ingredients entering the glass from the pot shall not impair the development of the above qualities.

In addition the furnace temperatures must be carefully controlled and the molten glass must be constantly stirred.



It would take 164 gas holders, each with a capacity of 5,000,000 cubic feet to hold the annual gas consumption of the glass plant at Rochester. If piled in stacks of five each, these holders would rise 1250 feet, the height of the Empire State Building in New York, and would occupy thirty acres of ground space or fifteen times the ground area of the building

The variation in the optical properties of the glass from pot to pot must be kept within very narrow limits in first quality glass.

The finished products are literally "Jewels of Victory."

Probably man has never built anything else so ponderous in size which requires such extreme precision in construction as the eyes of our fighting ships—the range finders. The largest range finder weighs six tons, contains 1,500 mechanical parts and as many as 135 optical parts. While they are long enough to span the gun turrets of our biggest man-of-war, they incorporate prisms that must be accurate to one-half second of arc. That means an allowable angular deviation of only one inch in 6½ miles.

In this war, there has never been a serious problem in optical glass production. Bausch and Lomb Optical Company of Rochester, New York has produced enough for its own needs and for the needs of other optical manufacturers. It has helped establish other sources of supply as further insurance against any eventuality. Since World War I, Bausch and Lomb glass plant has been producing optical glass continuously as a pledge to America—a pledge that never again would we have to depend on foreign sources for this vital war material. Without government subsidy, it absorbed the higher production costs and continued to produce and perfect its own optical glass.

Today, Bausch and Lomb, entirely in America, manufactures 109 different kinds of optical glass—glass which affords a wide variety of optical and physical properties.

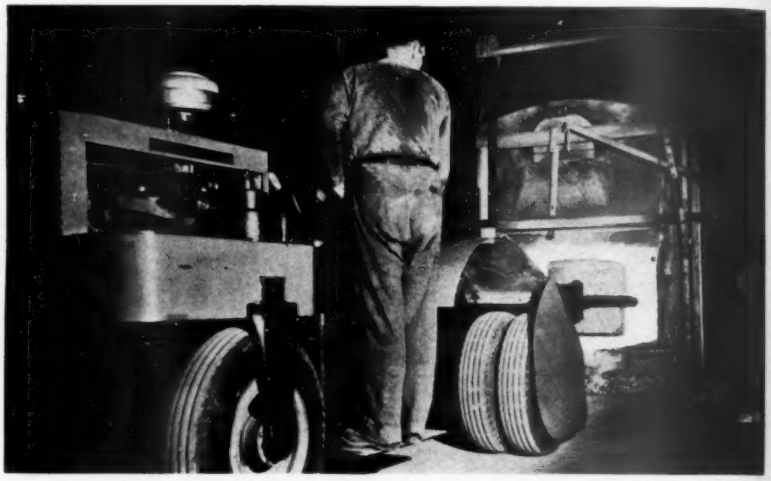
Production demands have far exceeded pre-war military estimates, but through construction of additional furnaces, by utilization of capacity to the very limit and by improved and speedier methods, the Bausch and Lomb glass plant has been able to meet every requirement.

The technique of optical glass production is a most exacting process that has been built up over a period of thirty years by constant research and development. However, we can briefly summarize the major production operations.

The clay pot, a heavy cylindrical vessel open at the top and measuring 30 to 42 inches in diameter, is cast from high grade clays. It is air dried for 3 months and then slowly heated to a temperature of 1800° F. over a period of 5 days in manually-controlled gas furnaces. It is then transferred to a regenerative type, direct fire, down draft melting furnace with hearth dimensions of approximately 8 ft. wide and 8 ft. deep and heated to between 2400° F. and 2600° F. depending on the type of glass being produced. Whatever type or size of furnace is used, two factors are fundamental to the production of good glass—maintenance of a definite temperature over a long period of time and constancy of temperature distribution within the heating chamber so that the pot is uniformly heated.

The raw material or batch is carefully weighed, thoroughly mixed and periodically charged into the pot until full. The melting and refining operations are usually carried on at 2600° F. while during the slow cooling stages the temperature is lowered to 2200° F. The molten glass is mechanically stirred during the entire process.

When the melt is judged to be finished, the furnace door is lifted, a portable mechanical fork picks up the finished pot of glass and transfers it to a cooling drum. The entire process of melting and stirring has consumed from 24 to 48 hours, depending on



Removing a pot of molten optical glass from the flaming gas furnaces

Pots of optical glass, melting and stirring of which takes 24 to 48 hours

Some of glass melting furnaces which produced the "crown jewels of victory"

type of glass produced, and the final cooling in the insulated drum takes 5 to 6 days.

The pot is then split away from the glass and the glass broken into chunks, examined and sorted according to size. After the defective pieces have been discarded, the glass passes to the trimmers, pressers, molders, grinders and polishers. It is again inspected and then returned to the vaults for eventual requisition by the optical scientists. They prescribe the type and shape to fit the design of the many optical instruments used by the Armed Forces and from now on by a great many peacetime precision instruments.

Thirty-one years ago, when few Americans even thought of the possibility of a World War, the Bausch and Lomb Optical Company, through the courage of William Bausch, founded the first successful optical glass plant on this hemisphere.

Lowell Thomas, on the occasion of Bausch and Lomb's Ninetieth Anniversary said over a national radio hook-up, "Before the start of the last war, William Bausch began his momentous three-year-long experiments, quietly overcoming the problem of raw materials, clay pots, temperature control and formulas—all of which were locked behind enemy lines. If it had not been for his foresight and vision prior to America's entry into that struggle, I bear personal witness to the fact that our forces would have marched into battle handicapped for lack of optical equipment." On its Ninetieth Anniversary, November 3, 1943, Bausch and Lomb celebrated the production of 3,000,000 pounds of optical glass since Pearl Harbor. This was not a gross figure, but the net poundage of glass inspected, approved and ready for processing.

Since then, the glass plant has passed still other milestones—4,500,000 pounds of optical glass and 100,000,000 molded lens blanks.

Heat is the important agent which alone makes possible the transformation of certain chemical elements, silica in sand, potash, borax and others, into glass. In so doing these common basic ingredients increase in value a thousandfold . . . . become a most important factor in modern civilization.

Gas is used almost without exception in glass making, especially where high grade optical glass is produced.

The Bausch and Lomb glass plant is the largest consumer of manufactured gas in the world, exclusive of steel manufacture. During the past three years its annual consumption has averaged 821,000,000 cubic feet (4,408,770 therms).

The Rochester Gas and Electric Corporation of Rochester, New York, has supplied the entire Bausch and Lomb gas requirements for over thirty years from its East Gas Works, adjacent to the Bausch and Lomb plant. Inasmuch as it is difficult to place cubic feet or therms of gas end to end for a representation of this annual gas consumption, it may be helpful to visualize this total annual gas consumption as stored in one hundred and sixty-four gas holders each with a capacity of 5,000,000 cubic feet. These gas holders if piled in stacks of five each would rise 1250 feet, and the required number of stacks would occupy thirty acres of ground space. This would equal the height of the Empire State Building and occupy fifteen times the ground area.

It is anticipated that peacetime requirements of ophthalmic and optical glasses will require continuous operation of many of the present furnaces with an annual consumption of approximately 80 percent of the past three years' average.

Selecting and Training of Service Employees

A VALUABLE report of current gas utility practice in selecting and training service employees has just been published by the American Gas Association's Committee on Gas Appliance Installation and Service Manuals, headed by Thomas J. Perry, of The Brooklyn Union Gas Company. Mr. Perry's committee submitted a suggested program for selecting and training service employees to some 40 large and small gas companies, asking for critical comment and for information on practices in their own companies. Numerous significant comments were received and the results are summarized in this report.

As pointed out in the committee's introduction to the booklet, "Selecting and Training Service Employees," many gas companies now have to meet the problem of hiring new men in order to rebuild and retrain customer service departments to meet postwar competition and to be able to take care of new and more complex appliances. The first aim of the committee was to find out tried and proved methods already in operation in successful departments.

A further step, which is not yet completed, is an investigation of the possibility of developing the elimination of undesirable candidates without the difficulty and uncertainty of aptitude or the complexity of personality tests. Results of this phase of the study will be published shortly.

The current published report is divided into six parts, as follows: selecting new employees; educational qualifications; training methods; training of plumber-dealer, etc., employees; scope of training program; and reduction in the service problem. It also includes a selected list of papers relating to service employee training.

Copies of "Selecting and Training Service Employees" may be obtained from the American Gas Association, 420 Lexington Ave., New York 17, N. Y., at a price of 25¢ each for members, 50¢ for non-members.

Functioning of a Home Planning Bureau

A well-balanced planning service provides opportunity to meet increased postwar sales tempo with an ace in the hole

BY FRANK L. MOON

Supervisor, Home Planning Bureau, Southern California Gas Co., Los Angeles, Calif.

Frank L. Moon

IT is apparent that the residential building program to come will bring forth every sales effort by sellers of competitive fuels and appliances. To meet this, it will be required that previous selling methods of the gas industry be completely overhauled, revised and increased in tempo. The future will require not only direct selling and cooperation with dealers, but a well-rounded program of aggressive national and local advertising plus greatly increased direct promotional effort.

As an active part of a promotional program, a Home Planning Bureau may be organized and developed as a division of a sales department to promote and sell the New Freedom Gas Kitchen idea and other gas uses in both new and old homes.

In Los Angeles, where the competition offered by other fuels to the use of gas for cooking, water heating and refrigeration has long been taken seriously, the Southern California Gas Company has developed a highly diversified program through its Home Planning Bureau. The bureau was set up a number of years ago to do a promotional job, functioning as a part of the Sales Department. Whether the department will continue to concentrate its efforts on promotional work or combine the sale of appliances with its other activities will be governed by the future overall sales picture. Obviously, the deciding factor will be the extent to which the range and refrigerator will be purchased by the builder and sold with the house on the house contract. Heretofore, in this area, only the water heating and heating equipment have been handled in this manner.

A series of A.I.A. form folders such as shown here are used as architect "door openers" by the Southern California Gas Co. A fly leaf attached to each folder pictured a "Fireplace of History," a reproduction in full color of an original painting by a well known artist

Although designed to be elastic in operation, the Home Planning Bureau can be divided roughly into three divisions, which are designated as Architect Promotion, Builder Promotion and Kitchen Planning. All three are tied in with the various sections of the Sales Department.

Because the architect and builder can be important factors in influencing the home-owner in the choice of fuel for his new home, most utilities have been contacting architects and builders to at

least some extent during the past decade. Some have made this an integral part of their sales program, while others made this contact only when it is necessary to obtain information concerning work progress. However, future building, combined with the probable increased activity by competitors, make this an increasingly important service for gas companies to maintain, both from a promotional and direct sales point of view.

Architect Promotion

The personnel for this effort must be carefully selected and trained in the fundamentals of utilization and installation of gas appliances; in the knowledge of what equipment is available and where it can be procured. They must be trained as well to be familiar with the products of competitors and competitive rate structures, and be able to present factual information covering comparative operating costs and performance of equipment.

This background makes it possible for men in this division to gain the confidence of the architect, and thus be in "on the ground floor" when new construction planning is in its preliminary stages.

In order to personalize the relationship between the architects and the gas company, the company contact men should keep in close touch with the architects and members of their staff, and keep them informed on progress of equipment design and utilization.

It is logical to expect that for a number of years architects and their staff will be too busy to take time out for appointments with everyone having something to sell. "Cold" calls on architects will prove to be discouraging to the gas company's contact representative. He should be provided with an interesting and informative "tool" to obtain audience.

In Southern California, "door openers" have been used by the company. One of the most effective was a series of A.I.A. form folders containing installation and utilization data pertaining to appliances used in the home.

To dress up each folder, a fly leaf was attached which pictured a "Fireplace of History," reproduced in full color from an original painting, especially executed for that purpose by a well known Southern California artist. The fly leaf was suitable for framing or for inclusion in a reference file on historical architecture, while the material itself could be used as a data file by the architect.

New folders came off the press at approximately two-month intervals. Additional folders and informative data sheets were printed and distributed from time to time as required. It is planned that similar tools will be prepared for future contact work.

The prospective architect should not be neglected in a promotional scheme. The architect contact representative should keep in close touch with schools teaching architecture or architectural drafting, whether high school, trade school or college. The result is that the graduate has full knowledge of gas appliances, their utilization and how to install them.

An example of how this intimate relationship with architectural schools can benefit the gas industry is evidenced by the results of a suggestion of an architect representative making this type of contact. A suggested kitchen planning project developed into a competition for the students at the School of Architecture at the University of Southern California.

The problem involved a study of the fundamentals of kitchen design, the use of materials, and the selection of gas appliances. Each student was required to build a scale model of his design. Judging was supervised by a nationally known architect.

These models served a further purpose when they were displayed in various offices of the gas company, arousing a great deal of customer interest. In several cases, plans of the models were requested.

Additional folders and informative data sheets are distributed from time to time

The builder representative also needs a "door opener" of special informative value

Builder Promotion

The work of builder contact representatives is comparable to that of the architect representative and they should be given approximately the same sort of training. They are usually able to obtain from builders the names and addresses of buyers of new homes. They should keep in constant touch with all new developments in their areas, particularly watching for contemplated model homes to make certain that gas appliances (particularly the range, refrigerator and water heater) are installed, if for no other reason than to complete a display.

In order to make speculative builders gas conscious, it is often desirable to promote gas-equipped model homes to the fullest practical extent. Interesting advertising programs may be developed to publicize outstanding model homes at the gas company's expense. Newspapers, as well as bill stuffers, may be used as vehicles to acquaint the home buying public with the location of the model home.

SOUTHERN CALIFORNIA GAS COMPANY

HOME PLANNING BUREAU

TO ENABLE US TO BETTER PLAN YOUR KITCHEN FOR BEAUTY AND EFFICIENCY ANSWER ALL QUESTIONS FULLY AND COMPLETELY

EQUIPMENT

STRUCTURAL FACTORS:

Data on kitchens for either new or remodeled structures is obtained via questionnaire

An interesting series of "ads" for this type of publicity were used in Los Angeles. For a period of seventy weeks this advertising appeared in the Sunday Real Estate section of the leading metropolitan papers; they were titled, "This Week's Best Bet in Model Homes," the copy being changed each week.

For each model home thus exploited, the builder was required to provide adequately for 4-use gas; the gas company, in turn, loaned gas range and gas refrigerator for display in each of the kitchens.

The result was a weekly display of all-gas model homes in the better class sections of the area, where it was not unusual to have an attendance of 3000 visitors during the week following the appearance of each advertisement. In several instances, the attendance was as high as 7500 visitors in a week.

Other services may be given the developers of large projects by assisting them in the preparation and cost of booklets describing a model display home to be featured. Promotional literature may be distributed as bill stuffers in areas adjacent to these model homes. They are comparatively inexpensive and a valuable medium of advertising, winning much builder support for gas.

In addition to working with builders, these representatives find it advantageous to keep in close contact with home-building loan agencies, large real estate operators, lumber companies furnishing a home advisory service, and manufacturers of kitchen cabinets.

In addition to their promotional job, the builder representatives may arrange for salesmen to call on the new home owners when a need arises; or as will probably be the case in the future, be prepared to quote and sell the package kitchen as required by the builder.

The builder representative also needs a good "door opener"; perhaps not as pretentious as used with architects, but of equal informative value.

Both architect and builder representatives are primarily promotional men acting as liaison personnel for the various sections of a Sales Department.

Kitchen Planning

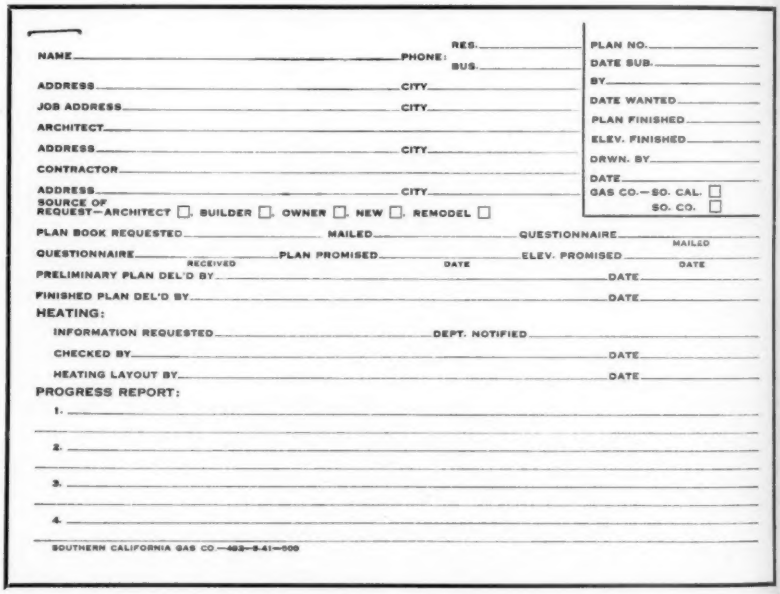
A Kitchen Planning Section has been functioning as a part of the Southern California Gas Company's Sales Department for the past ten years.

At first the Kitchen Planning Service was offered only to the public. Several display kitchens were set up in principal offices of the company, and in the Architect's Building Exhibit. No attempt was made to solicit planning requests, *directly*, but requests for information about kitchen design and subsequent requests for related services were handled by an architectural draftsman staff.

Eventually, it appeared that the kitchen planning facility could serve four additional purposes if it were also offered to architects and builders. It would (1) offset competition by getting in on the ground floor, (2) furnish the sales force with new leads, (3) insure adequate provision and space for proper installation of gas appliances, and (4) furnish the contact man with another "door opener."

Data for either new or remodeled structures is obtained through the use of a questionnaire. This supplies enough information to obviate, almost completely, going into the field to recheck dimensions.

Plans are then prepared, either with or without elevations, depending upon the type of request (architects and builders rarely require elevations, in-



NAME ____ PHONE: RES. ____ BUS. ____

ADDRESS ____ CITY ____

JOB ADDRESS ____ CITY ____

ARCHITECT ____

ADDRESS ____ CITY ____

CONTRACTOR ____

ADDRESS ____ CITY ____

SOURCE OF REQUEST—ARCHITECT ☐ BUILDER ☐ OWNER ☐ NEW ☐ REMODEL ☐

PLAN NO. ____

DATE SUB. ____

BY ____

DATE WANTED ____

PLAN FINISHED ____

ELEV. FINISHED ____

DRWN. BY ____

DATE ____

GAS CO.—SO. CAL. ☐ SO. CO. ☐

PLAN BOOK REQUESTED ____ MAILED ____ QUESTIONNAIRE MAILED ____

QUESTIONNAIRE RECEIVED ____ PLAN PROMISED DATE ____ ELEV. PROMISED DATE ____

PRELIMINARY PLAN DEL'D BY ____ DATE ____

FINISHED PLAN DEL'D BY ____ DATE ____

HEATING:

INFORMATION REQUESTED ____ DEPT. NOTIFIED ____

CHECKED BY ____ DATE ____

HEATING LAYOUT BY ____ DATE ____

PROGRESS REPORT:

1. ____

2. ____

3. ____

4. ____

SOUTHERN CALIFORNIA GAS CO.—423—9-41—500

Completed kitchen plans are numbered and a card record is made of each request

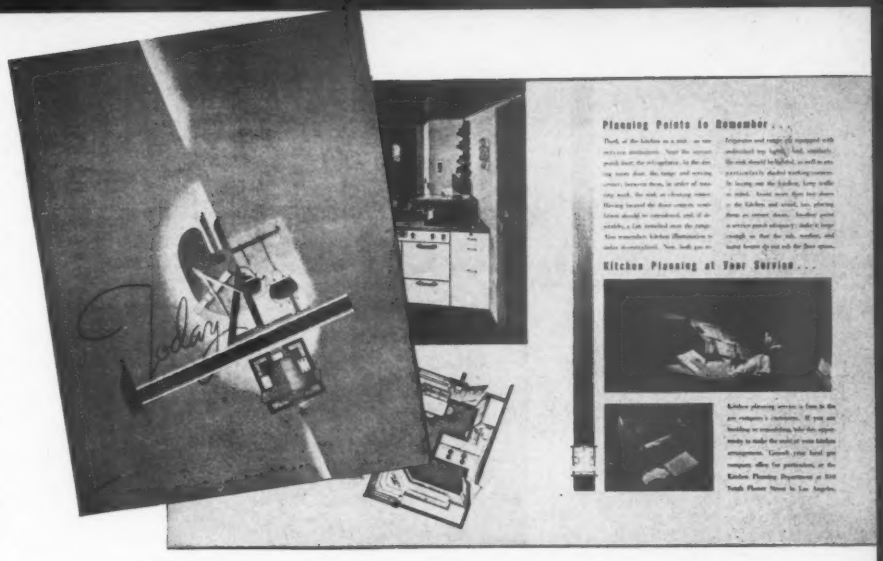
dividual home owners usually require them) and as many blueprints are furnished as are required. Color schemes are not usually included unless called for by individuals as it is felt that most housewives have definite preferences. In no instance is a color scheme voluntarily recommended to an architect or builder.

The completed plans are then numbered and a card record is made of each request. The card record furnishes an appliance lead for the domestic sales force.

The success of this activity brought requests for supplementary information, which were met by lectures and booklets. Two types of lectures were prepared. One used accompanying slides in color depicting various types of floor plans and perspectives of finished kitchens taken from actual photographs or from renderings; a complete story was thus built up around the use of gas in the kitchen. This lecture was used with considerable success for women's clubs, P.T.A. meetings, college and junior college classes in architecture, and home economics classes in high schools.

However, each such lecture required the services of two men—lecturer and machine operator. It was, therefore, decided to produce a slide-film strip to be used in lieu of this lecture, for additional groups. Copies of the film were distributed by the Boards of Education in each principal area served by both the Southern Counties Gas Company and the Southern California Gas Company; one or more films being given to each school having classes in either home economics or architecture.

Furnished with the film, for class use, was a tie-in instruction sheet on kitchen planning along with an accompanying work sheet for a kitchen planning problem. A total of 425 films were distributed—350 to the Los Angeles Board of Education, the balance to other schools on the systems of the two companies.



As a promotional piece of color-literature for use with selected new construction prospects, a booklet entitled "Today Kitchens Are Planned" was developed

As a promotional piece of color—literature for use with selected new construction prospects, a booklet entitled "Today Kitchens Are Planned" was developed. One of its features was thumbnail reproductions of plans of kitchens, with notes indicating that these plans were available on request. The demand for these plans was so great that a second booklet, "Supplement to Today Kitchens Are Planned" was prepared, containing thirty floor plans reproduced to scale one-quarter of an inch to the foot to permit easy tracing—for ready incorporation in homes.

Just what lies in front of the gas company in the postwar era is anybody's guess. It is probably safe to say that the volume of home building will at least equal the volume during the few years preceding the war, and that there wil. be enough remodeling and modernizing to provide an immense new and replacement market. Competitors will be after the business just as hard as will the gas utility.

In Southern California it is planned to use every feasible form of promotional and sales effort. Architect and builder promotion will be used to a greater extent than before, and kitchen planning will, of necessity, become an aggressive division of the Sales Department. It is our conviction that the New Freedom Gas Kitchen scheme will play an important part in our future sales program.

Model kitchen shows what can be done with careful planning and modern gas appliances

It Works

● "Take your hat off to the past and your coat off to the future."—Paul G. Hoffman, President, Studebaker Corporation, and Chairman, Committee for Economic Development.

● When you look at the prospect which do you see first—his need, or his objections?—Western Life News

● You'd be surprised how you can win friends and influence people, if you have some idea of what you're talking about.—Channing Pollock

Natural Gas Investigation Begins

Many of the nation's foremost authorities on production and uses of natural gas met in Kansas City, Mo., September 18 for the initial hearing of a nation-wide natural gas investigation being conducted by the Federal Power Commission. The Kansas City hearing was expected to last from two to three weeks after which a hearing would be held in Oklahoma City starting on October 9. A third session will take place in New Orleans, October 30, and a fourth meeting will be held in Dallas, Texas, November 27. Following final conferences in Washington, the F.P.C. is expected to present recommendations to Congress. A summary of the first day's testimony, prepared by Louis E. Whyte, educational director of the Independent Natural Gas Association of America, is presented below.

AT the outset, Commissioner Nelson Lee Smith, presiding, read a statement outlining the Commission's position with respect to the purpose and scope of the hearings. He sought to emphasize that the investigation is purely a fact-finding inquiry for the benefit of the Congress, the Commission, the states and local authorities, the industry as well as its competitors and the general public. He asserted that issues which have been raised in cases which the Commission has heard causes the Commission to feel that it does not now have adequate information to deal effectively with the various contentions, such as end use, the holding of gas in production areas, and matters generally of broad public policy "some of which appear to go beyond its (the Commission's) authority under the Natural Gas Act."

Government Stocktaking

"It seems clear," Commissioner Smith also stated, "that any administrative agency—which operates as an arm of the legislature in interpreting and applying to specific situations the regulatory policies expressed generally in the statutes under which it functions—should pause from time to time to make certain essential appraisals. This stocktaking should include more than just an inquiry into the effectiveness of its own specific performance; it should involve consideration of the soundness of its interpretations of the legislative expressions of policy and an evaluation of those policies themselves. This, in turn, necessarily must embrace a survey of conditions within the regulated industry as affected by the regulatory policies of the agency and of such conditions and policies—not only upon the owners and customers of the regulated business, but also upon allied or competitive industrial groups—all viewed in the light of the general public interest, which is of paramount importance."

First witness was Mayor John B. Gage of Kansas City, who offered this proposal: "That the Federal Power Commission, by new legislation, should be authorized in its control of the construction and extension of interstate gas pipelines and the granting of certificates of public convenience and necessity to give force and effect on behalf of the Federal Government to the decisions, rules and regulations of authorities of the state in which the natural gas originates which are designed in the opinion of that Commission to promote sound conservation in the national interest of the end use of the natural gas which the proposed pipeline is to be constructed to transport."

Such legislation, Mayor Gage said, "would involve placing primary responsibility and authority where I believe it should in the first instance rest—that is in the local regulatory authority. It would sweep aside all constitutional objections. The responsibility for conservation would rest primarily with the one most interested—the state conservation agency of the state where the gas was produced."

Next witness was Governor Andrew Schoeppel of Kansas, who spoke as chairman of the Interstate Oil Compact Commission. He reviewed the history and accomplishments of the I.O.C.C., and left little doubt that in his opinion the Federal Government should not be given additional authority over the gas industry.

"Practically every American citizen," he said, "recognizes that whatever can be most efficiently done by the state or local government should not be attempted by the federal government. We think this general principle is accepted by all men, regardless of political affiliation. If the conservation of gas and oil can best be carried out by the states, all will agree that the states should retain such power."

Gas Reserves Held Ample

Dr. E. DeGolyer, nationally known geologist and engineer, was the next witness, being put on the stand by the Natural Gas Industry Committee—the only witness the industry group plans to present during these regional hearings. He declared that the present proven reserves of natural gas in the United States amounts to in excess of 140 trillion cubic feet—enough to last at present rates of production for some 35 years.

Dr. DeGolyer said that "the outlook for the discovery of additional gas reserves in substantial quantity is distinctly favorable."

Relative to his estimates on reserves, he added that if small fields are included and allowance is made for a probable extension of discovered fields not yet fully explored, "we are justified in considering our present reserves to be something of the order of magnitude of 200 trillion cubic feet."

"In my opinion," he added, "the outlook in the United States is for activity on an increasing scale in exploration for oil. I believe that the result of such effort is likely to be the discovery of substantial reserves of natural gas. . . . It is fairly well established by recent experience that there is greater likelihood of the mineral hydrocarbons occurring in the gaseous phase than of their occurring in the liquid phase under the relatively high pressures and high temperatures which prevail at great depth. We know that exploration to increasingly greater depths is and must be a marked characteristic of our continued search for oil."

It is on this basis that he contends that the outlook for discovery of additional gas reserves in substantial quantities is most favorable.

T. A. Morgan, director of the Conservation Division of the Kansas State Corporation Commission, reviewed the history of the gas industry in Kansas; L. B. Taylor, conservation engineer of the same Commission, discussed the condition of the gas fields in Kansas, stating, among other things, that the reserves in the Hugoton field, at current production rates, will have a life of 125 years.

The last witness was J. B. Kirk of Iola, Kans., who reviewed the history of the Iola gas fields.

"Natural Gases" Enters Publications' Field

A NEW magazine devoted to the natural gas industry made its bow in September. Called "Natural Gases," its aim is to blanket the natural gas, natural gasoline and liquefied petroleum gas fields with hard-hitting informative copy.

Published by Oildom Publishing Company, 1217 Hudson Boulevard, Bayonne, N. J., its editorial offices are at 918 World Building, Tulsa, Oklahoma. Officers are: O. C. Klinger, publisher; Keith Clevenger, general manager; Andrew M. Rowley, editor. Mr. Clevenger was formerly publicity and advertising director of the American Gas Association, while Mr. Rowley is well known as natural gas and petroleum editor of one of Tulsa's daily newspapers, and was formerly associated with *Oil and Gas Journal*.

The first issue is an attractively printed 32-page publication with much of the editorial content turned to the current Federal Power Commission investigation of the natural gas industry. Among the features are articles on the aims and record of the Independent Natural Gas Association of America, conservation of natural gas, and Texas' natural gas policy. Special departments are devoted to news of natural gas, liquefied petroleum gases, natural gasoline and dealers' doings.

Subscription rate is $3.00 per year.

Tennessee Gas Holdings Sold

CHICAGO Corp. has sold its interest in Tennessee Gas and Transmission Co. to a group headed by Stone and Webster, Inc., for $10,500,000, Richard Wagner, president of Chicago Corp., announced.

Chicago Corp.'s contracts for sale to Tennessee Gas of 90 per cent of its initial natural gas requirements run to Sept. 1, 1970, and are not affected by the sale, Mr. Wagner said.

It is understood that the sale has been made to avoid the possible risk of Chicago Corp. being classified as a natural gas company by the Federal Power Commission because of its holdings in the pipe line company.

New England Home Service Conference

THE New England Home Service Development Conference sponsored by the New England Gas Association opened in Boston, September 17, with registration from 25 utility companies in the New England area. Susan Mack, of the Boston Consolidated Gas Company, as chairman of the Home Service Group in the N. E. G. A. and Mrs Lillian Dunbar of the Cambridge Gas Light Company, as chairman of the Educational Committee, were in charge of the program.

Sessions were held in the auditorium of the Boston Consolidated Gas Company in appropriate and colorful settings of displays of modern gas kitchens and new gas equipment. These settings were arranged by the display department under the direction of H. R. Gleason.

David S. Reynolds, president of the New England Gas Association, struck the keynote when he said: "There can be no question but that there is a tremendous deferred demand for gas appliances for the simple reason that very few such appliances have been sold for a long time.

Home Service on Solid Ground

"It seems to me that the larger deferred appliance demand, the acceleration of the higher living standards movement and the increasingly favorable attitude toward home service because of its war activities—constitute a large and strong foundation upon which you people can build in the postwar period. Not only do these three developments exist but our New England gas companies have recognized this fact. For instance, they have helped to make this conference possible so that you may have the very latest and the very best information for your daily use. New England gas company management recognizes the opportunities and the responsibilities facing home service departments."

The executive secretary of the New England Gas Assocaition, Clark Belden, in greeting the group, called public relations the most important single problem confronting American business concerns today. "Any company department," he said, "the work of which deals in customer service, has a vital opportunity and responsibility to help the company build good public relations. The home service department of every gas company has a remarkably fine opportunity along customer service and thus along public relations lines. The foregoing factors mean one thing: The possibilities of accomplishing a constructive purpose for the gas companies and for the public rests right on the middle of the desk of every home service worker in America. This is the greatest challenge which home service departments have ever faced."

Background information for home service departments in their contacts with customers was presented in four papers as follows:

Development of the Gas Industry—Gordon G. Howie, vice-president and general manager, Cambridge Gas Light Company.

One of the sessions at the New England Home Service Development Conference

Officers and speakers at the Conference. Left to right, bottom row: Charlotte Semple; Jessie McQueen, home service counsellor, American Gas Association; Hall M. Henry; Gordon M. Howie; Robert E. Finnin; Clark Belden; Lillian Dunbar, chairman, Home Service Educational Committee; and Hazel A. Cheever. Top row: Doris Connors; Gladys Bramblett; Ralph S. Carter; David S. Reynolds, president, New England Gas Association; John J. Quinn; Susan A. Mack, chairman, N.E.G.A. Home Service Group; and Clement Moody

History and Development of Home Service—Jessie McQueen, home service counsellor, American Gas Association.

The Place of Home Service in the Gas Company—Hall M. Henry, director of gas operations, Negea Service Corporation, Cambridge.

Manufacture of Gas—Ralph S. Carter, general superintendent, Malden and Melrose Gas Light Company.

Mr. Henry described the functions and objectives of Home Service and listed methods to use in accomplishing the objectives: As a part of company operation home service functions best with properly selected and trained home service employees. It is their obligation to be closely attuned to what customers think of gas as a fuel and to report it to company management. Management expects from home service real accomplishment for the dollar spent on this activity. A well managed home service department can be the eyes and ears of the gas company and one of its most effective voices in expounding the virtues of gas fuel. Mr. Henry concluded: "It is my firm conviction that our industry will pass up its greatest potential builder of gas prestige and sales if it fails to use and employ an adequate and properly trained home service department."

Mr. Carter, in his address on the "Manufacture of Gas" explained this subject in nontechnical language and illustrated with charts and experiments the way in which gas is manufactured. The history and development

of home service was presented by Jessie McQueen of the A. G. A. who traced the development of home service through organization to predictions of some things to come.

The first afternoon program opened with a review of visual aids to arouse customer interest, presented by Charlotte Semple, Gloucester Gas Light Company. As part of this subject, Mrs. Lyda Flanders gave a demonstration of the B.t.u. puppets and the Magic Gas Kitchen—the popular program presented for wide group coverage in Worcester, Massachusetts, by the home service department of the Worcester Gas Light Company.

Radio possibilities and newspaper writing techniques were presented by representatives of the newspaper and radio field in Boston and Clement W. Moody, sales manager, Cambridge Gas Light Company, closed the home service discussion with a description of the use of home calls as personalized gas company service. The second day of the conference considered the subject of Home Service Selection and Training, presented by W. D. Williams of the Public Service Electric & Gas Company. Mr. Williams pointed out methods of selecting the right person for this important work and outlined ways in which interviews and aptitude tests could simplify the problem.

Servicing of ranges, refrigerators and water heaters as background information for home service to know about equipment were presented by Leo A. Peachey, assistant service superintendent of the Boston Consolidated Gas Company and William H. Hanson, service superintendent of the Providence Gas Company. Both speakers used charts, cutaway models and sketches to present the subjects and answered many questions of the home service group on inquiries which come to them from women customers on the operation of their equipment.

The remainder of the week's conference included equipment discussions, a resume of the New Freedom Gas Kitchen Program, and "Things to come," a symposium of several speakers led by J. J. Quinn, sales manager, Boston Consolidated Gas Company. In this symposium, he demonstrated the equipment and displays made available to the conference by manufacturers of equipment.

Radio Program "Let's Talk Houses" Attracts Large Audience

JUDGING from the volume of "fan mail" and verbal inquiries is prompted, the "Let's Talk Houses" radio program in Portland, Ore., struck a responsive note in home-conscious listeners—so much so that the sponsor has prepared a booklet of highlights from the 13 broadcasts.

Aired each Saturday at 6:30 P.M. over station KXL, the program was sponsored by Portland Gas & Coke Company and featured members of the Portland Home Builders' Association with occasional guest authorities. However, the association's own membership, including associate and affiliate members, represents building supply dealers, allied building trades and firms that handle home financing.

Each broadcast was in the form of a panel discussion and featured not more than five participants. The 13 topics were: How to Go About Getting a Home Built; Financing the Home; Relations of Contractor and Architect; Actual Construction; Use of Materials; Making Plans; New Gadgets for Postwar Homes; Plumbing, Heating and Lighting; Interior Finishing; Landscaping; What Women Want in a Home; and Review and Conclusions.

Participants thoroughly familiarized themselves with their subject matter and submitted four or five questions with written answers. For the sake of spontaneity and informality, members of the panel did not rely upon a script. Five days before going on the air, members of the week's panel met to discuss their questions. Later a complete studio rehearsal was held.

As a guide for the program's moderator, Fred Eicchorn of KXL, a script outlining questions and the background of each panel member was prepared. The moderator asked each question, calling first upon the participant originally assigned the question. In the order in which they raised a hand, others were called upon for comments. No answer to any question was allowed to run over 40 seconds, thereby assuring a lively tempo for the program. Questions sent in by listeners were used informally in the broadcasts, giving names of the writers.

The program was advertised each Saturday by Portland Gas & Coke Company in the radio columns of the daily newspapers. Easel cards were given prominence in show windows of realtors, finance firms, material dealers and other places arranged for by the association and the gas company.

A keen interest in the series was evident even before the first broadcast and after only a few weeks inquiries regarding the program were being received from various parts of the country. Many of the participants received personal inquiries very soon after the broadcasts.

As a result of so many inquiries by listeners who wanted what they had heard for reference, or had missed certain broadcasts, a booklet has been compiled and is now being distributed to all those requesting it.

R. G. Barnett, vice-president and general manager, Portland Gas and Coke Co., and Edwin Sandberg, president of the builders, going over inquiries resulting from popular radio program

Letters from England Win Commendation

DURING the war period, many people in the gas industry have had the rare privilege of reading first-hand accounts of the experience of many individuals and utility companies in England. In many instances, the information received was all that was available in a period when history was being made and censorship and lack of communications prevented us from getting a true picture of what was happening on the other side of the Atlantic. Some of the material was published in the MONTHLY and other trade magazines.

This unique and valuable pipeline to Britain was due to the inspiration and unselfish endeavor of Davis M. DeBard, vice-president of Stone and Webster Service Corp. who fostered this correspondence and, without charge, sent copies regularly to more than 40,000 readers in the gas, electric and telephone industries. The gas industry can well join its electrical friends in the expression of gratitude contained in the following editorial in *Electrical World*:

"FOR THE PAST FIVE YEARS members of the electrical industry have had the pleasure of reading a series of letters from English men and women engaged directly or indirectly in the supply of utility service—gas, telephone and electricity. The first of the year the letters passed 100 in number. It is estimated by Davis M. DeBard, who alone and without compensation has acted as the American end of the correspondence and its dissemination, that these news letters are now read by more than 40,000 people in this country.

"To Mr. DeBard and his 26 English correspondents, we who have been privileged to read these letters regularly are deeply indebted—not alone for the intimate information concerning the effect of war upon utilities, information not obtainable in the daily press, but for the opportunity to understand better our fellow allies. We are sure that others felt pretty much the same, that there was something personal about the letters that never is felt in the reading of newspaper accounts. It was the intimacy of understanding that came from these letters that made many of us feel that we knew our English friends better. . . .

"Some day we hope that a grateful industry will find some appropriate way to express to Mr. DeBard its appreciation."

Artificial Respiration

BY W. R. SMITH

Safety Engineer, Public Service Electric and Gas Co., Newark, N. J.

Authorities on the subject of manual techniques stress importance of immediate and uninterrupted artificial respiration whenever natural breathing is inadequate.

OVER the past several years there have arisen doubts in the minds of some of those in the electric light and power and gas industries concerning the matter of what is the correct procedure when a person whose breathing has been stopped or in any way affected as a result of electric shock, gas poisoning, or drowning, is breathing irregularly or weakly. These doubts have concerned the following questions specifically:

Q1) If the victim is gasping or breathing weakly and irregularly when discovered should artificial respiration be withheld until victim stops breathing?

Q2) If after artificial respiration has been administered for a time to a non-breathing victim, natural breathing begins and the victim gasps and breathes weakly and intermittently, should artificial respiration be continued?

Q3) Are the chances of recovery of a person whose breathing has been stopped or made irregular by accident lessened by any interference of the artificial respiration with the feeble natural breathing because of the fact that the cycles of artificial respiration might be out-of-step with the feeble natural effort?

Eminent Authorities Consulted

On behalf of the American Gas Association, and the Edison Electric Institute, opinions on those questions were recently asked of eminent authorities in the field of physiology and allied fields of research and the above questions have been answered unqualifiedly as follows:

A1) If victim is not breathing in a manner such that there is good evidence of adequacy of lung ventilation artificial respiration should be started at once. This means that in practically all cases where a victim is discovered gasping or breathing rapidly and weakly or spasmodically artificial respiration should be administered without delay.

A2) As artificial respiration is administered, the operator should observe the victim to note any signs of the return of natural breathing. If such return is quite positive as is sometimes the case the operator should pause for a moment to see if the victim is going to breathe naturally. If, however, this breathing is irregular, weak, or in any other respect ineffective in the operator's judgment, he should continue with his regular cadence of artificial respiration with no necessity for attempting to adjust his cadence to the rapid, slow, or intermittent breathing of the victim.

It is of interest in the above connection to call attention to the fact that there have been a number of instances over the past several years in which victims of suspended respiration have, on being resuscitated, asked for assistance in breathing because of their inability to satisfy their needs through their own natural breathing. Comments to such effect in the sworn statements of those who administered artificial respiration successfully are highly significant in connection with the subject of the above discussion, and give positive evidence of the fact that the continuance of artificial respiration is in every way indicated if lung ventilation is inadequate.

A3) There appears to be no evidence to support any fear that the victim's chances of recovery are lessened by any interference of the manual method with the returning natural respiration. Such research as has been carried on and which is pertinent to this consideration has indicated that any effective manual method definitely takes over the job of ventilating the lungs and there is no conflict with any continuing natural effort. Obviously, as stated above, in all cases where artificial respiration is required there should be momentary pauses, when there is justification for such pause, to see if the victim is going to breathe naturally, but whenever the natural effort is in any way inadequate artificial respiration should be immediately resumed.

The statements made above confirm the opinions of those in the electric light and power and gas industries who have been close to the development of manual techniques and also of those who have had the opportunity to study the experience in these industries over the years since the standardization of the prone pressure method. These statements have been presented to and discussed with representatives of the American Red Cross and the suggestion made that these points be considered in connection with any forthcoming revision of the American Red Cross First Aid Text Book.

Oil Film Available

A REVISED Bureau of Mines sound educational film "The Evolution of the Oil Industry," was released in September for free showing to schools, colleges, business and civic clubs, industrial and vocational training classes, etc. Running time is 34 minutes and the film covers all phases of the industry.

MANY RACES MAKE A GREAT PEOPLE

BY DANA BARNUM

WHY have the people of the U. S. A. such sublime confidence in our fighting men, in our leaders and in our productive engineers, that even in the face of a catastrophe like Pearl Harbor we are never in doubt of final triumph over our enemies.

We tackle tremendous projects, like fighting wars thousands of miles away in Europe and in the Pacific and never doubt their outcome. Millions of men, tons of munitions, hundreds of thousands of aircraft, millions of ship tonnage, nothing daunts us.

We are all aware of the hundreds of thousands of items necessary to provide our fighting forces with all they need, but even with all the men and materials there is something else needed to explain our victories.

We have met the perfected army of Germany and fanatical hordes of Japan and found that we have what it takes to beat them.

What is it that makes us superior? Among our people are to be found men with the characteristics of nearly every race on earth. A complete fighting force should have every known human faculty and the United States is the only country that can furnish through its development by emigration, men with the characteristics of many races.

An armed force needs imagination, initiative, versatility, stability, leadership, spirit, fighting instinct, guts, sense of humor, hard-headedness, confidence and faith.

Our men have all these attributes and many others and where do they get them?

America started with North American Indians, a great fighting people until we debauched them; witness the achievements of Chief Joseph, Geronimo, Sitting Bull and others. Was there ever more steadfast fighters than the English, only once was an English Square ever broken, there are no more tenacious scrappers than the British. Who ever loved a fight more than an Irishman? The Latin races have given us inspired spirits such as Garibaldi and Napoleon and the Balkan races have shown us preserverance. The Slavs have furnished us with plodding never-say-die stubbornness. The Hebrews have contributed imagination and the Swedes stability. The German blood in the American people has furnished obedience and the value of discipline. The traits we have inherited are infinite in variety.

Our armed forces have men with special adaptability for every individual military operation and millions with combination of inherited faculties that make "first class fighting men."

We sense all this and it is reflected in our superb confidence in our generals, our admirals, our marines, our flyers, our engineers, our industrialists and in ourselves.

These faculties that we have acquired through democratic ways and means show themselves in our accomplishments in peace and in war and in our humaneness, forbearance, charity, liberalism and our great faith in God and Country.

New A. G. A. Members

GAS COMPANIES

Central Electric & Gas Co., Sioux Falls, S. D. (H. A. Hanson)*

Consumers Gas Corp., Bend, Oregon (Carl A. Johnson)

Gulf Public Service Co., Inc., New Iberia, La. (C. J. Schexnayder)

Knoxville Electric Power & Water Board, Knoxville, Tenn. (Max C. Bartlett)

MANUFACTURER COMPANIES

Anchor Burner Co., Oklahoma City, Oklahoma (W. H. Stewart)

The Deutsch Co., Los Angeles, California (D. L. Hulse)

The Floral City Heater Co., Monroe, Michigan (L. C. Bauer)

The National Cash Register Co., Dayton, Ohio (J. F. O'Hearn)

Universal Metal Products, Los Angeles, Calif. (L. J. Miller)

Hart Manufacturing Co., Louisville, Kentucky (W. M. Smock)

INDIVIDUAL MEMBERS

R. H. Anderson, Bradford Corp., Gas Dept., Bradford, Yorkshire, England

John G. Bennett, Caloric Gas Stove Works, Philadelphia, Pa.

Celia S. Bush, The Estate Stove Co., Hamilton, Ohio

Edward N. Button, Rochester Gas & Electric Corp., Rochester, N. Y.

Gordon Calderwood, Rochester Gas & Electric Corp., Rochester, N. Y.

Carl E. Cloud, Oklahoma Natural Gas Co., Tulsa, Oklahoma

H. J. Cullington, Pacific Gas & Electric Co., San Francisco, Calif.

Frank C. Culver, Day & Night Manufacturing Co., Seattle, Washington

James B. Earnest, Savannah-St. Augustine Gas Co., Savannah, Georgia

Wesley C. Ekholm, Columbian Carbon Co., Brooklyn, N. Y.

Paul E. Ewers, Michigan Consolidated Gas Co., Detroit, Michigan

Howard E. Ferris, Savannah-St. Augustine Gas Co., Savannah, Georgia

Lyda Flanders, Worcester Gas Light Co., Worcester, Mass.

Morris Groverman, Jr., Northern Indiana Public Service Co., Hammond, Ind.

Mrs. Ada Harbaugh, The Gas Service Co., Joplin, Missouri

Mrs. J. Hartridge, Savannah-St. Augustine Gas Co., Savannah, Georgia

Thelma Holmes, Alabama Gas Co., Montgomery, Alabama

H. G. Jobe, Pacific Gas & Electric Co., San Francisco, Calif.

Robert L. Johnson, Florida Power & Light Co., Daytona Beach, Florida

E. Ladouceur, Pacific Gas & Electric Co., San Francisco, Calif.

Frederick L. Linzer, Savannah-St. Augustine Gas Co., Savannah, Georgia

E. M. Marshall, Pacific Gas & Electric Co., San Francisco, Calif.

Vivian L. Marshall, New Orleans Public Service Inc., New Orleans, La.

Irene Muntz, Rochester Gas & Electric Corp., Rochester, N. Y.

Edward Nelson, Rochester Gas & Electric Corp., Rochester, N. Y.

Walton K. Nussbaum, Savannah-St. Augustine Gas Co., Savannah, Georgia

Vernon F. Parry, U. S. Bureau of Mines, Golden, Colorado.

Mrs. Winnell Simmons, Houston Natural Gas Corp., Houston, Texas

Harold R. Snedeker, Savannah-St. Augustine Gas Co., Savannah, Georgia

Richard K. Stover, McCann-Erickson, Inc., New York, N. Y.

John F. Thompson, Rochester Gas & Electric Corp., Rochester, N. Y.

Frank Valenza, Rochester Gas & Electric Corp., Rochester, N. Y.

Mrs. N. C. Watkins, Allentown-Bethlehem Gas Co., Allentown, Pa.

Paul C. White, Commonwealth Gas Corp., New York, N. Y.

Professor Robert R. White, University of Michigan, Ann Arbor, Michigan

Florence J. Windecker, The Tappan Stove Co., Mansfield, Ohio

* Na.. es in parentheses are Company Delegates of the American Gas Association.

Oklahoma Gas Division Holds Annual Meeting

THE annual meeting of the gas division of the Oklahoma Utilities Association was held Sept. 21 at the Biltmore Hotel in Oklahoma City, Okla. A considerable number of utility delegates from that territory attended the meeting which was under the chairmanship of L. A. Farmer, president, Northern Oklahoma Gas Co., Ponca City. Greetings of the American Gas Association were brought by George H. Smith, assistant managing director.

Marshall Newcomb, general counsel, Lone Star Gas Co., Dallas, Texas, gave an able address on "Legal Aspects of Exportation of Natural Gas," in the opening program feature. "End Uses of Natural Gas" were discussed by J. H. Warden, general sales manager, Oklahoma Natural Gas Co., Tulsa, and chairman, A. G. A. Residential Gas Section. Attention was directed to the problems of the returning war veteran in a talk by Milt Phillips, secretary, State Veterans Service Committee Oklahoma City, which concluded the morning session.

Following a luncheon meeting at which D. S. Kennedy, president, Oklahoma Utilities Association, presided, A. O. Beyer, Coleman Co., Inc., Fort Worth, spoke on "Selling, Sizing, Locating and Installing Floor Furnaces." Norman Hirschfield, vice-president, Consolidated Gas Utilities Corp., Oklahoma City, gave some pointers on "Helping Dealers and Manufacturers Sell Better Gas Appliances." Other subjects and speakers at the afternoon meeting included: "The New Freedom Gas Kitchen," M. H. North, Oklahoma Natural Gas Co., Tulsa; "Report from Servel," Seward Abbott; and "Gas Appliance Safety Committee Report," Carl Dean, Oklahoma Natural Gas Company.

Convention Calendar

OCTOBER

2 •New England Gas Association, Safety Conference, Boston, Mass.

3-4 •Pacific Coast Gas Association Annual Meeting, Del Monte Lodge, Pebble Beach, Calif.

16 •New England Gas Association, Appliance Servicing Conference, Boston, Mass.

17 •New England Gas Association, Operating Division, Boston, Mass.

22-24 •Mid-West Gas School and Conference, Iowa State College, Ames, Iowa.

24 •Gild of Ancient Supplers Annual Meeting, New York, N. Y.

24-25 •American Gas Association Annual Meeting, Engineering Societies Building, New York, N. Y.

NOVEMBER

12-16 •American Petroleum Institute Annual Meeting, Chicago, Ill.

15-16 •Mid-Southeastern Gas Association Annual Meeting, Sir Walter Hotel, Raleigh, N. C.

26 •Independent Natural Gas Association of America, annual meeting, Dallas, Texas.

1946

JUNE

18-21 •Canadian Gas Association, 39th Annual Convention, Manor Richelieu Hotel, Murray Bay, Quebec.

Accounting Section

Pension Accounting

BY A. T. GARDNER

Delaware Power & Light Co., Wilmington, Del.

THE principal scope of the work assigned to the committee was as follows:

"Survey of Regulatory Commission Orders and Court Cases with respect to accounting for an interpretation of past liability pension costs for plans recently put into effect."

Discussions among committee members indicated that the scope of the work might well be expanded without detracting from the principal purpose of the committee, as outlined above. With this in mind it was decided to give at least passing consideration to the following additional matters:

Accounting for Pension Costs
Capitalization of Pension Costs
Balance Sheet Presentation
Cost of Administration

Regulatory Commission Orders and Court Cases

A survey of regulatory commission orders and court cases indicates that in only a few cases have State or Federal Commissions issued formal orders or instructions with respect to accounting for pension costs. Although the survey made cannot be considered as complete, it appears that the appropriate treatment of pension costs has not been an important element in rate proceedings.

Among the twenty-three states surveyed, it appears that the commissions for the states of New York, Pennsylvania, Michigan, and Alabama are the only ones which have given consideration or formal recognition to this matter beyond the instructions contained in the uniform system of accounts.

In a letter dated June 5, 1944, to the public utilities of Pennsylvania, the Pennsylvania Public Utilities Commission referred to the problems in connection with the treatment of the costs of pension plans which included the element of past service, and concluded their letter with the following:

"The Commission therefore directs that, for accounting purposes, no payment or amortization of an unfunded pension liability, made subsequent to December 31, 1943, shall be charged to operating expenses."

In a subsequent communication dated December 27, 1944, the Pennsylvania Public Utilities Commission advised that the effective date of its directive dated June 5, 1944 was changed from January 1, 1944 to January 1, 1945.

In its Second Amendatory Order the Public Service Commission of New York added the following to the instructions contained in the Uniform System of Accounts with respect to Account 800.2—Pensions:

"E. The total charges to this account in any year for pensions paid and accruals for future pensions shall not exceed the amount applicable to that year under a reasonable and consistent program for apportioning the cost of pensions upon the basis of increased efficiency or other advantages to electric operations resulting from the utility's pension plan."

Although the above instructions are capable of various interpretations, the attitude of the New York Commission appears to be set forth in a 1937 rate case opinion involving Kings County Lighting Company. In referring to pension costs the Commission stated, "this amount covers, in part, provision for past service and hence is not properly a charge against current operations in full. If such provision is made, that charge should be made against surplus and not against current operating revenues. This method has been followed by certain companies in dealing with the matter."

A Joint A.G.A.-E.E.I. Committee Report

In February, 1945, the State Legislature of Oregon enacted a bill giving the Oregon Public Utilities Commissioner authority over "expenditures for pensions or for a trust to provide pensions for employees and officers." The same bill also contained the following provision with respect to expenditures for pensions:

"Provided always that proposed expenditures for pensions or for a trust to provide pensions for the employees and officers of such utility whether for future service or past service or both shall be recognized as an operating expense if such pensions are reasonable and nondiscriminatory. Any such pension trust which has been approved by the commissioner of internal revenue under the provisions of the internal revenue code of the United States shall be conclusively presumed to be reasonable and nondiscriminatory."

The order of the Michigan Public Utilities Commission, dated May 22, 1945, read in part as follows:

"That the Detroit Edison Company shall forthwith cease and desist from the charging as an operating expense . . . (d) any provision for pension costs for:

(1) Past service actuarial liability,
(2) Employees' salaries in excess of $3,000 per year.

That the Detroit Edison Company shall charge to Income or Surplus, its contribution for past service cost of pensions and costs for pensions based on employees' salaries in excess of $3,000 per year."

In addition to the above instructions with respect to accounting for pension costs, the Commission disallowed, as deductions for rate making purposes, the cost of pensions based on salaries in excess of $3,000 per year, and the expenses of "amortizing the unfunded actuarial liability for past service pensions at the time of the adoption of the plan."

The Public Service Commission of Alabama in the summer of 1944 intimated that the rate payers should not be charged for pensions for employees receiving $5,000 or more or in other words that the cost of such pensions should not be charged to operating expenses. Whether or not this Commission will take formal action in this regard is not determinable at this time.

In the case of the New England Telephone and Telegraph Company the Circuit Court of Appeals of the First Circuit refused to interfere with the order of the Federal Communications Commission requiring the company to provide for its provisions for accrued liabilities by charges to a surplus account rather than an expense account. This case is in several respects distinguishable from the pension plans recently adopted by certain public utility companies. In the first instance the Federal Communications Commission classification of accounts in question differs materially from those of the Federal Power Commission and N.A.R.U.C. In the second instance one of the grounds on which the F.C.C. based its order against the New England Telephone and Telegraph Company was that part of the accrued liability in question had accrued subsequent to the institution of the pension plan and prior to the period for which the charge is being made. Under pension plans recently adopted by electric and gas utilities, or those being considered for adoption, the provisions for the accrued liability would be begun on the initiation of

the plan. Both of these differences appear to be material distinctions.

In the above case, as reported in Federal Supplement, Volume 53, commencing on page 400, the text of the Interstate Commerce Classification of Accounts with regard to pensions is quoted as follows:

"672 Relief Department and Pensions

This account should include pensions or other benefits paid to employees or representatives of former employees and expenses in connection therewith; salaries and expenses incurred in conducting a relief department, and contributions made to such department."

It is believed this account was continued in effect by the Federal Communications Commission but it is not known whether or not the above quotation contains the complete text of the account.

Informal inquiries made of utility executives connected with companies operating in eighteen of the twenty-three states surveyed indicate that the state commissions have not adopted definite policies with respect to either accounting for that portion of the pension costs as measured by service prior to the effective date of a pension plan, nor have such commissions had occasion to consider such costs in rate proceedings. The majority of the individuals contacted expressed the view that state commissions would be inclined to allow as operating expense the cost of pensions regardless of how calculated provided such costs were allowed by the Bureau of Internal Revenue as a deduction for tax purposes during the year incurred or were amortized over a reasonable period.

Accounting for Pension Costs

The text of the account for "Pensions" in the Federal Power Commission and N.A.R.U.C. Classifications of Accounts reads as follows:

"800.2 Pensions.

A. This account shall include pensions paid to retired employees or to their heirs.

B. If the utility has definitely undertaken by contract to pay pensions to employees of its electric department when retired, it shall charge to this account monthly amounts to provide for the payment of such pensions or for the purchase of annuities for that purpose.

C. The utility shall maintain a complete record of the computation of the accruals of its pension liabilities.

D. The utility shall inform the Commission of the details of the pension plan, giving a full statement of the facts thereof, together with the actuarial formula, if any, under which it has created or proposes to create its pension fund, and shall furnish a copy of the declaration of trust or resolution under which the pension plan is established."

Pension plans generally measure the amount of pension an employee is entitled to receive at retirement by the length of service determined retroactively to the first date of employment. For practical reasons, actuaries and others segregate the cost of the pension between "past service liability" and "future service liability." These terms are frequently improperly used and convey a misunderstanding. Actually there is no past liability. The years of employment are merely used as a measure to determine the amount of the pension to be paid when an employee is retired at some future date and becomes eligible to the pension. A pension plan is intended to take care of an employee in declining years after reaching a certain age, so that an employer may retire an employee when he or she becomes less efficient and make an economical replacement by employing a younger person who is more efficient. Pensions are payable under certain conditions in the future and as such are a future liability, therefore, the present and future rate payer of a utility should bear the entire cost thereof through operating expenses.

Pensions Encouraged by Gov't Agencies

Pension plans are encouraged by governmental agencies and in the opinion of the committee are adopted by utilities for sound business reasons. In addition to the reasons for adopting pension plans mentioned above a systematic pension plan provides many other benefits including the following:

(a) Keeps the organization young and able to cope with present and future problems.

(b) Discourages the more valuable, mature, and far-seeing employees from seeking possible better positions elsewhere by improving opportunities for advancement through quicker elimination of older employees.

(c) Attracts the better type of new employee; such employee frequently inquires as to the retirement income plan of a prospective employer.

(d) To a greater extent relieves employees of worry or concern about their future security and thereby increases their efficiency and effectiveness in company affairs.

(e) Enables the company to retire workers whose lack of alertness or inefficiency, because of age, may endanger others or in the case of supervisory positions may seriously retard the work of others.

(f) Contributes to good relations between the employees and the company and the public.

The many advantages and benefits, of which the foregoing are by no means all, accrue not to the customers of a utility who have been served by it prior to the adoption of a pension plan, but will accrue to the benefit of the present and future customers. It therefore seems that the cost of any pension plan is properly chargeable as a current and future operating expense.

It is obvious that the Uniform System of Accounts does not provide answers to all problems which may arise in accounting for pension costs. With the above discussion in mind, it is still possible that as a result of special regulatory commission requirements, or because of the desirability of completely funding "past service liability" by means of a single or small number of lump payments, such costs are not invariably included in operating expenses, or if so included may be charged thereto under an amortization program.

It appears that the costs related to "past service liability" could properly (from an accounting standpoint) be handled by any one of the following ways:

When paid over a period of years—

1. Charged to operating expenses (Account 800.2—Pensions) as paid.
2. Charged to income deductions (Account 538—Miscellaneous Income Deductions) as paid.

When paid in one or more lump sums—

1. Charged to earned surplus (Account 271).
2. Charged to deferred debits (Account 146 —Other Deferred Debits) and thereafter amortized over a period of years to either operating expenses or income deductions.

Where the liability for past service is liquidated by one or more lump payments, it is not believed desirable to charge the income account immediately in full with such payments as a substantial distortion of the income statement would result.

In the event past service costs are charged to accounts other than regular operating expenses, consideration should be given to the principle set forth in Accounting Bulletin No. 23 of the Committee on Accounting Procedure of the American Institute of Accountants. This bulletin deals with accounting for income taxes, and suggests that where substantial charges are made to surplus effecting income tax liability, tax savings related to such charge should correspondingly be credited to surplus, leaving undisturbed taxes pertaining to the income resulting from normal operations. There appears to be some tendency on the part of regulatory commissions to oppose the inclusion in the operating expense accounts for Federal taxes of any amounts in excess of taxes actually paid; however, it does not appear equitable that operating expenses should be distorted as the result of unusual or non-reoccurring charges to other than operating expense accounts.

It is not the intention of the Pension Accounting Committee to make recommendations with respect to matters which are more properly within the jurisdiction of other committees of the E. E. I. and the A. G. A., such as the Accounting Principles Committee of the E. E. I.; however, it is believed that this report would be incomplete without at least brief reference to the accounting problems involved in connection with the handling of pension costs.

Capitalization of Pension Costs

Whether or not an individual utility company will desire to capi alize any portion of pension costs will probably depend, to a

Transition

● Better than 20,000,000 people will have changed jobs before this time next year. *Printers' Ink,* Sept. 28, says it will "give researchers an opportunity to show how adept they are in locating sudden changes in population and earnings."

large extent, upon the practice of the company with respect to the capitalization of other indirect and overhead costs. The exact methods which might be followed by various companies are too numerous to be fully discussed here. However, in general, the methods used would normally follow those applied to other types of indirect construction costs. It is the opinion of the committee that where pension costs are considered to be allocable to construction work, it would be unnecessary and probably undesirable to attempt to allocate such charges on the basis of costs applicable to individual employees.

While in a sense pension costs as well as group life or health insurance premiums and any other expenses incurred for employee welfare are additional compensation to employees, such costs are not usually so regarded, nor are they required by the Bureau of Internal Revenue regulations to be reported as taxable income to the individual employee; and the committee feels that they should be carefully distinguished in the accounts from true payroll charges. If they are capitalized it should be on a principle of apportionment applicable to other overhead or indirect costs and not as an additional compensation to specific employees engaged in construction work.

Balance Sheet Presentation

In general, the pension plans adopted by utility companies contain provisions for their termination, and, therefore, as of a given date no liability for future payments generally exist. Amounts paid by the company, either to trust funds or to insurance companies, are generally not recoverable by the company and must be used to provide benefits for employees; therefore, no such amounts can be considered as assets of the company.

It has not been the general practice of companies within the industry to include any references to pension plans in the footnotes to the financial statements, and it does not appear that there is any need for such footnotes. Adequate disclosure of pension plans to securityholders has generally been made through published annual reports of the companies, and through proxy material issued in connection with the obtaining of stockholders approval for pension plans.

Costs of Administration

The adoption of a pension plan inevitably results in additional expenses in connection with the administration of the plan. While it may be desirable to segregate such costs, particularly where a separate group is set up for administration purposes, it appears that no provision is contained in the Uniform System of Accounts for charging such expenses to Account 800.2—Pensions.

Travel Ban Lifted

ALL government bans on conventions, group meetings and trade shows will be lifted October 1, but the Office of Defense Transportation has warned that travel must still be kept to a minimum.

New Appliance Financing Plan Announced

A UNIQUE financing plan designed to aid public utilities in installment selling of gas and electrical appliances has been announced by the Chase National Bank of New York City. Known as the Chase Confirmed Installment Paper Credit, the plan is available to utilities throughout the nation. It is equally adaptable to companies engaged in merchandising and to companies cooperating with dealers by helping to finance their sales.

Utilities arranging for credit under the plan can draw sums under a flexible procedure as installment sales are made, at low interest rates against installment paper maturing in not more than forty-eight months.

Bookkeeping for the utilities has been simplified inasmuch as the transaction with the bank is considered as an account payable rather than as a note.

The plan leaves much latitude to the utility in working out dealer financing arrangements and appears to have several outstanding features, such as insurance of a firm rate of low cost money, no maturities while the credit is in effect, no notes, no pledge of paper and one simple monthly report made up from information easily obtained from company records.

For the past fifteen years, Chase National Bank has maintained a completely integrated public utilities department with operating engineers, lawyers and statisticians.

Gas Revenues Gain in Second Quarter

TOTAL revenues of the gas industry in the three months ended June 30, 1945 were $280,594,700, a gain of 4.4 per cent over revenues of $268,648,100 in the comparable quarter of 1944, the American Gas Association's statistical bureau has announced. Customers on June 30 totaled 19,838,400, an increase of 2.2 per cent over 19,419,000 customers a year earlier. These figures exclude sales of gas to other utilities for resale.

Revenues for the manufactured and mixed gas industry for the June 1945 quarter were $111,748,200, a gain of 2.9 per cent over $108,552,400 for the like 1944 quarter and natural gas sales revenues were $168,846,500, up 5.5 per cent over $160,095,700 a year earlier.

Measured in volume of sales, manufactured and mixed gas send-out in the second quarter of 1945 was 121,350,400 MCF, an increase of 2 per cent over the like period of 1944 and sales of natural gas totaled 534,390,900 MCF, a gain of 2.7 per cent over the second quarter of 1944.

For the 12 months ended June 30, 1945, total revenues of the gas industry were $1,147,090,400, a gain of 4.4 per cent over $1,099,069,500 a year earlier. Manufactured and mixed gas revenues were $449,973,900, a gain of 4 per cent and natural gas revenues were $697,116,500, an increase of 4.6 per cent.

Revenues from sales to residential customers, including house heating, in the second quarter of this year totaled $175,096,000, a gain of 4.5 per cent over a year earlier. Commercial and industrial sales totaled $105,498,700, an increase of 4.3 per cent. In the 12 months ended June 30, 1945, residential sales revenues were $716,118,600, an increase of 4.5 per cent over a year earlier, and commercial and industrial sales revenues were $430,971,800, an increase of 4.2 per cent over the previous 12 month period.

Veterans' Assistance

THE director of Selective Service, Lewis B. Hershey, has issued a comprehensive statement of policy governing the Selective Service Veterans Assistance Program which is available upon request to National Headquarters, Selective Service System, Washington 25, D. C. Also available are copies of a complete Handbook of the Veterans Assistance Program.

Servel Report Cited

SERVEL INC. has been given a certificate of merit for the excellence of the company's annual report to employees and stockholders by *Financial World*, national investment weekly.

Servel is one of 372 companies in the country to receive this citation. *Financial World* also announced that the reports of these 372 companies will be further judged and awards will be made for the best reports in each of fifty industries.

The companies chosen to be included in the final judging were selected from 2500 corporations who submitted annual reports.

Returning Veterans Get Gas Story

REALIZING that many employees in war service have lost touch with their organization, the Birmingham (England) city gas department took the unique step of publishing a history of the department's progress during the war years 1939 to 1945. Distributed as an attractively printed booklet, it conveys not only a warm feeling of welcome to returning employees but gives a clear-cut story of the gas department's problems and growth during this period.

In addition to citing problems of gas production and distribution during the "blitz" period, it carries photographs of war damage to the gas plant and interesting details of service to domestic and industrial consumers.

According to the booklet, more than 1,100 gas mains up to 48 inches in diameter were broken and extensive damage was done at each gas works. Six employees lost their lives by enemy action while performing their duties and three received the "George" Medal, while five were commended for gallantry.

Of the department's 3,500 employees at the outbreak of hostilities, 822 joined the armed forces, and 67 are listed as killed or missing.

Alexander W. Lee is general manager and secretary of the department.

Venting the Gas Fireplace

R. F. Cleary

BY R. F. CLEARY

Homestead Heater Co., Newark, N. J.

POSTWAR Planning has received a lot of attention from the viewpoint of what manufacturers should produce. Would it be out of order for a manufacturer to point out one way that the utilities could help themselves, their customers and some of the manufacturers?

All natural gas territories and some manufactured gas territories have many houses with "dummy" or so-called "gas fireplaces." Many of these fireplaces have no flue or vent. Because of moisture conditions they are seldom satisfactory; but at least they were honestly unvented and so acknowledged. (See Figure 1.)

In other instances it was recognized that some vent was advisable and the gas fireplaces were built with what was purported to be a vent. However in every instance the writer has checked, the vent did not and could not be expected to function. The usual method of supplying this so-called ventilation was to leave a small opening in an inconspicuous place. The products of combustion were supposed to find this opening in some miraculous manner and then escape into the space between the inner and outer walls. (Shown in Figure 2.)

Ventilating Efforts

Less frequently, a more definite effort was made to supply the desired ventilation. A flue or vent was carried from the fireplace up through the roof. Good, as far as it went, but here again the products have to find a small hole in the top flat surface of the fireplace opening. The products were not directed to the hole, so the vent never really functioned. (See Figure 3.)

This condition can and should be corrected in the new houses to be built after the war. Three benefits will justify the effort and the small amount of expense entailed:

1—It will result in the householder receiving greater satisfaction from the gas unit in his fireplace.

2—Improved satisfaction will mean more sales of fireplace heaters, and *more gas load at the top domestic rates.*

3—It puts gas in the living room where its convenience and efficiency may be enjoyed in complete relaxation.

May we digress, from proper ventilation, long enough to comment on this last benefit. Many utility sales executives bemoan the fact that gas lacks glamour in comparison with its "push the button" or "snap a switch" competitor.

Gas *does not* lack glamour, utilized in a fireplace.

It is hard to get glamour into a gas range on which a woman expects to cook 1095 meals a year—there is too much unglamorous work associated with it. It is hard to get glamour into the best of automatic water heaters for the same reasons—visions of thousands of dirty dishes, weekly laundries—and children's dirty hands and faces, keep injecting tiresome work thoughts into the picture. The gas refrigerator is better; but in comparison with the social ice cubes is the thought of meals, food, marketing and in war time, "points," to obscure the glamour. In short gas, the perfect, efficient fuel, is generally associated with the kitchen, work, washing clothes and dishes—marketing, meals to cook and other unglamourous, repetitious chores. Not much chance for glamour after you reach the age where you are no longer impressed with the story of "Cinderella."

However there is one job in the home where gas can be glamorous. Where it can give comfort and satisfaction with no thought of work. In fact gas in the fireplace suggests rest, relaxation, company, entertainment and all that is desirable, coupled with the assurance that there will be no dirty hearth and no dust from ashes to clean up afterward.

Think it over and perhaps you will decide that it will be worth your while to develop that glamour. Complete satisfaction from the gas fireplaces that will be built in your territory is the starting point.

Now to get back to the proper construction of the vents in the gas fireplace.

The remedy is simple. *Gather the products at the top of the fireplace opening and conduct them to the vent.* (Figures 4, 5, 6, 7.) It is so simple that it has been given little or no thought and as a result thousands of gas users are not getting the satisfaction their gas fireplace could render.

Behind every gas or dummy fireplace breast, is an empty space surrounded by some type of building material. All that is necessary is that this empty space be so shaped that it functions to conduct the "products" to the flue or vent. The type of construction, the building material involved and the style and location of the fireplace will be as varied as the number of fireplaces. Nevertheless the principles used to produce satisfactory ventilation will be the same in every case.

The inverted hopper or funnel shape shown in Figure 6 may be altered to accommodate the studding in the walls. It can be gathered to the vent to the right of the center; or the left of center up to the full width of the fireplace opening. Thus the location of the vertical section of the flue may be accommodated to the framework of the wall against which the fireplace is placed. This is indicated in Figures 4 and 5.

The problem of how the inverted hopper is made will be up to the individual architect, owner or contracting builder. Very satis-

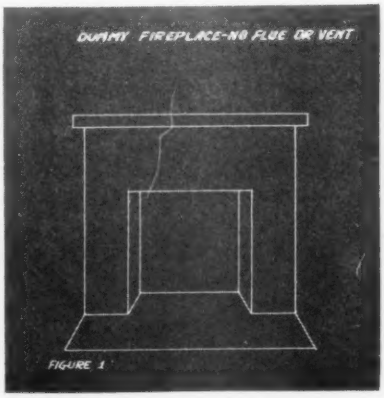


FIGURE 1

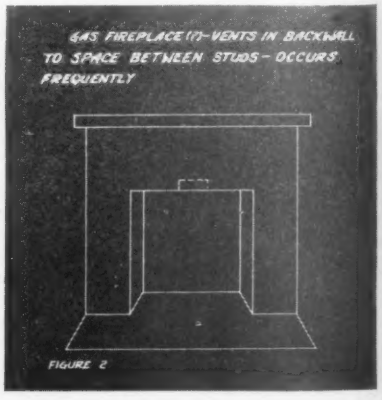


FIGURE 2

factory results have been achieved in the past by shaping a form of sheet metal lath, places it on top of the fire place opening as the construction proceeds and covering it with a well trowelled scratch and finish coat of cement plaster.

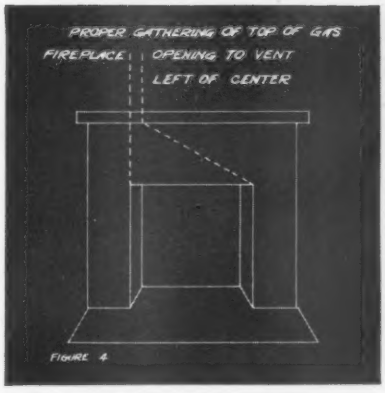
Aluminum producers tell us that aluminum will be cheaper after reconversion. That being the case we are inclined to suggest that funnel be made of 26 gauge sheet aluminum. In this connection we suggest a study of the elaborate treatise on "Gas Appliance Venting" published by the Payne Furnace & Supply Co. Inc., of Beverly Hills, California. Notice how easily their stock Vertical Stack Siamese and Lateral Siamese Fittings could be adapted for fireplace use by leaving off the multiple face. The Payne booklet should be read by every gas man as it is an outstanding contribution to the gas industry.

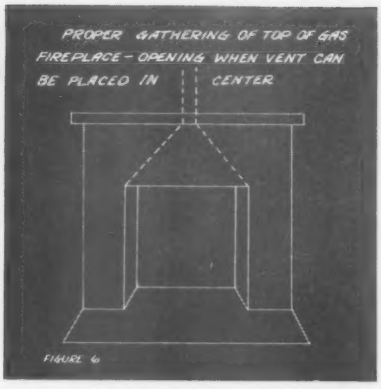
Johns-Manville Co. also makes products adaptable to the job. We understand there are various other concerns making suitable materials. Our interest at present is not in what materials are used; but rather proper design regardless of the material.

It would cost very little for each utility to develop sketches and copy showing the proper design for venting gas fireplaces. It could be developed as a one-page data sheet for architects and builders. It could be used as a piece of complimentary literature to send to the prospective home builder. It would probably be accepted for reader interest articles on real estate pages in most newspapers.

Every gas company salesman *should understand it* and carry copies in his kit.

Many other means of distribution will suggest themselves. Active promotion of the idea is needed and justified. The architects, of course, should be impressed by its value in showing their professional capacity to design a better functioning home. The speculative builders will be the fellows to really sell. They are the same fellows that built so many non-functioning gas fireplaces because no one suggested anything different. Speculative builders are interested in sales points for their homes. Work with them until one or more start to build properly designed gas fireplaces. When built, the speculative builder and his salesman are going to call the attention of prospective home buyers to the improved type of gas fireplace in the house they are selling. Shoppers for homes are going to ask about how the gas fireplace is vented as soon as they realize how important it can be to their satisfaction. In a short while, builders not primarily interested will be forced by competition to fall in line. It costs so little to vent the fireplace property that they will not be able to resist the trend.





The utility will gain in good will, customer satisfaction and in opportunities for profitable added load. The utility will also gain in getting gas into the social rooms of the house, instead of only in the kitchen, cellar or work rooms of the house. Gas can then take its place with the glamorous silk shaded floor lamps, the radios and television of the future; and smugly say, "If it were not for me, it would be too damp and cold to sit in here."

Maybe you think you need not worry about fireplace ventilation. Perhaps not, but it is a job that you could do now and put into effect at once. You would get credit for it as a forward looking contribution on your part.

We'll admit we're biased in thinking about fireplaces but we cannot help feeling that the results of a survey made by the Small Homes Guide would surprise many gas utility executives.

This was a truly elaborate survey "to find out what home owners and prospective home owners are thinking about in the line of remodeling their homes, or building new ones, including both construction and decorative treatments."

The first 1285 replies tabulated showed that in the homes they expected to own after the war

379 expected to use gas for heating fuel
169 expected to use gas for refrigeration
476 expected to use gas as a cooking fuel

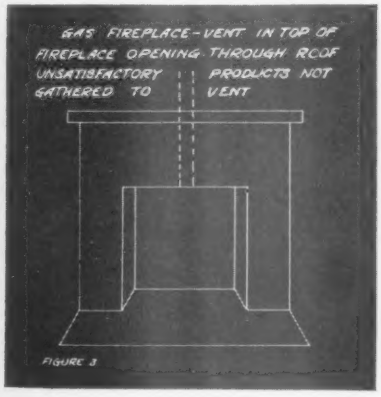
and 1084 out of the 1285 answered YES to the question—"Do you expect to have a fireplace?"

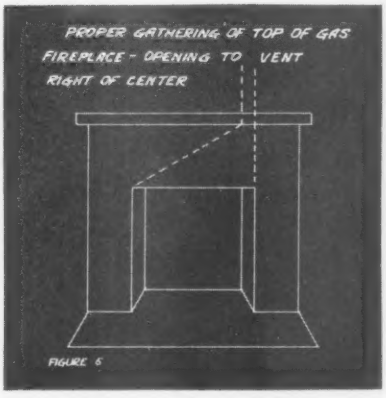
Like the poor and taxes, fireplaces will always be with us. They have a glamour all their own. They mean a home rather than a house; a place of rest and relaxation with family and friends. Why not let gas come in the front door and join this select circle by helping to make the gas fireplaces function properly?

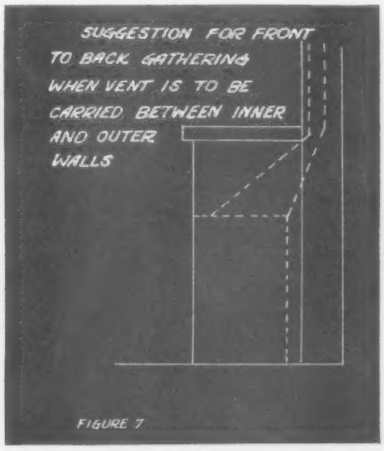
Building Curbs Off

RECONVERSION Director John W. Snyder announced September 18 the lifting of all restrictions on construction of private homes and other buildings, effective October 15. He also made public a six-point program designed to speed the expansion of the building industry.

Simultaneously, the War Production Board disclosed that its famed order "L-41" will be revoked as of October 15.







Jersey Central Halts Merchandising, Seiple Sets Up Appliance Firm

B. A. Seiple

COMPLETE withdrawal of the Jersey Central Power and Light Company from the field of merchandising gas and electrical appliances and the formation of a new company for the sale of appliances by Bernard A. Seiple, vice-president in charge of sales for the utility, was announced on Sept. 5 in a joint statement by Mr. Seiple and E. H. Werner, president of Jersey Central.

Elevation of G. A. Parker, gas sales supervisor of Jersey Central, to the position of manager of domestic sales, was also announced by Mr. Werner. Mr. Parker will devote a good deal of his time in the immediate future to the development of a postwar sales policy and incidental plans for an active dealer cooperative plan of postwar merchandising throughout the area of Jersey Central, Mr. Werner said.

G. A. Parker

Mr. Seiple, a past chairman of the A. G. A. Residential Gas Section, has left the utility to establish himself in business with Clyde H. Butcher, who will be vice-president of the new company, and E. Stanley Marks, who will be secretary and general counsel. Mrs. Eliza Stephenson, home service director for Jersey Central and past chairman of the A. G. A. Home Service Committee, will also join the new firm, continuing her work in the home service field.

To Sell Gas and Electric Goods

The company will sell a complete line of electric and gas appliances for homes, commercial establishments and industrial concerns, including radios and air conditioning throughout Monmouth and Ocean Counties. A complete service department is included in the plans of the new firm. Headquarters will be at 701 Main Street, Asbury Park, and additional sales offices and show rooms will be opened at Red Bank, Point Pleasant and Freehold.

Messrs. Seiple and Butcher bring to the appliance dealer field a wide experience in every phase of the use of gas and electricity in homes, stores and industries. Mr. Seiple has been vice-president in charge of sales for Jersey Central since 1928 and Mr. Butcher has been electric sales manager for the company since 1929.

As chairman of many governing and policy-making groups in both the American Gas Association and the Edison Electric Institute, Mr. Seiple has had an unusual opportunity to observe the experience of appliance dealers and utilities from coast to coast. In addition to being a past chairman of the A. G. A. Residential Gas Section, he is a member of the Section's Managing Committee; chairman of the A. G. A. Sales Policies' Subcommittee of the Postwar Planning Committee, and a director of the New Jersey Gas Association.

Associated with the new company will be many of the salesmen formerly employed by Jersey Central, among them being G. Gerard Barnett, Jr., of Point Pleasant, former sales supervisor, Norman Scott of Keyport, Donald Graman of Red Bank, Robert Milligan of Long Branch, Oscar Wells of Asbury Park, Nicholas Katte of Asbury Park, William Miller of Point Pleasant, Fred von Brook of Belmar, William Pettit of Lakewood, Theodore Tollman of Toms River, James Fagen of Freehold, and LeRoy West of Hightstown.

Mr. Werner in commenting on Mr. Seiple's plans for organizing his own appliance company, said, "Mr. Seiple is leaving us with a splendid record of utility merchandising for our company and his decision to establish his own appliance sales and service company has the hearty endorsement of the Jersey Central Power & Light Company and my personal best wishes for his success.

"Jersey Central is withdrawing from the merchandising field in Monmouth & Ocean Counties to devote its energy to the production of electricity and gas exclusively. It is giving appliance merchandising back to the dealers, to specialized business, where, in my opinion, it properly belongs today.

"As a utility we shall work co-operatively with appliance dealers, Mr. Seiple and others who may be preparing to enter the field. We shall maintain a promotional staff of experienced men which, supplemented by our technical engineers, can be of service and help to appliance dealers and thus indirectly to our customers.

"As I visualize the public utility function, it is the delivery of kilowatt-hours of electricity and cubic feet of gas from our generating plants through our transmission and distribution systems to the consumer at the lowest possible rate consistent with good service. Whatever problems may exist in our approach to this concept of our public status are related to the public only in so far as they may affect the prime reason for our business—to give good service at the lowest cost to the public. Withdrawing from the merchandising field will not adversely affect the consumer."

Gas Range Production on Upswing

PRODUCTION of gas stoves is increasing and is expected to reach 150,000 in December, 1945, the War Production Board reported Sept. 17. By June 1946, it is estimated that production will be at the rate of 220,000 per month, well above the average monthly rate of 165,000 for the prewar year, July 1, 1940—June 30, 1941. This monthly rate of 165,000 was considered high by prewar standards of demand and supply, W.P.B. pointed out.

New models of gas stoves will not appear on the market until some time in 1946, because they require new dies which are not yet obtainable. Production, at least through the early months of 1946, will be limited to present models with only such slight modifications as can be made with existing dies.

The stove industry is now employing approximately 40,000 workers, as compared with 51,000 workers prior to the war, according to surveys made by W.P.B.'s Plumbing and Heating Division. Present expansion of production indicates that more than 60,000 workers will be needed in the industry by June, 1946. The gas range segment of the industry expects to absorb manpower increase of 24 per cent over prewar levels by June 1946.

Data on production of various types of cooking stoves and appliances and of heating stoves for the base-period year and for 1943 and 1944 follow:

	Base Period (1940-41)	1943	1944
Domestic Cooking Appliances			
Gas Ranges	1,961,138	328,061	598,000
Hot Plates	135,106	15,536	33,500
Coal & Wood	620,031	395,362	368,000
Oil & Gasoline	1,372,979	346,978	599,000
Combination	179,459	32,546	69,700
Portable & Drum	314,807	371,116	397,000
Total	4,583,520	1,489,599	2,065,200
Domestic Heating Stoves			
Gas	1,308,426	334,991	548,000
Oil	1,093,732	120,307	325,000
Coal & Wood	1,876,124	1,948,470	1,515,000
Total	4,278,282	2,403,768	2,388,000

Gas Steam Cooker Meets the Test

BY K. L. SEELBACH

The Cleveland Range Co., Cleveland, Ohio

EUCLID BEACH PARK located on the shores of Lake Erie near Cleveland is the setting for Dwight's restaurant. Amusement seekers in large numbers visit this well-equipped park which for many years has served as a recreational and meeting place for Northern Ohio residents. The restaurant, which is of the resort style, serves a variety of meals ranging from light lunches to full course dinners, in an attractive dining room located adjacently to the beach where cooling breezes provide natural air conditioning.

Forecasting the park attendance and consequently the restaurant patronage has always been a major problem, since changes in the weather for instance are directly reflected in the size of the crowds. What often has started as a busy day has by dinner time evaporated into almost nothing.

Such a handicap, superimposed upon the trying wartime conditions of ordinary restaurant operation, created a real obstacle to efficient management and the director of the restaurant, Dwight Sincebaugh, foresaw the need of improvements in facilities and procedures. The installation of large refrigerated storage capacity was part of the answer, but the problem of food wastage seemed difficult to solve.

Often during pleasant weather, some 3,000 people would be served over a period of two hours and ordinarily this required advance preparation of large quantities of food with the use of existing equipment. However, if threatening clouds appeared in the afternoon, the crowds would thin out and much of the food previously prepared would be a total loss.

To solve this problem, a gas-operated steam cooker was procured. This equipment is very similar to the heavy duty steamers long used in hotels, hospitals and other mass feeding operations,—however no central steam source on the premises is required. Instead, steam in exact accordance with cooking requirements is automatically generated by means of a built-in gas-heated boiler. Automatic pressure and water level controls eliminate all hand regulation. Such steam cookers can steam approximately 500 pounds of vegetables per hour, if required, and can start turning out cooked food 15 or 20 minutes after the first lot has been inserted.

The steaming procedure eliminates the long period required to bring water in large stock pots to a boil on the range top. It also eliminates the time required for the water to resume boiling after the food has been placed in the kettles. In addition, the steaming process under moderate pressure is faster than boiling in open vessels so that for several reasons, substantial time savings are made by this method. The steamer also eliminates the handling of cumbersome pots of food and water which in spite of everything have a tendency to boil over or burn dry with resultant loss of time and material. Instead, the ranges are relieved and are available for short order and other special cooking operations.

As may be surmised, the gas-heated steamer has greatly improved control of the situation. This season just passed, operation was considerably smoother and wastage appreciably reduced by the new technique. Now cooking is commenced late in the afternoon instead of early. Vegetables are prepared and cooked just in advance of requirements and if the latter fall away or accelerate, the preparation and cooking automatically keep pace. This flexibility is due entirely to the steamer which is constantly ready and standing by for service, the instant this is required. The freshly cooked food is also much superior to that prepared in advance and then held in steam table storage.

Gas-operated steamers are now available to all food service establishments, and all restrictions on the manufacture, sale and purchase have been removed. Units with one or two doors are to be had and various options are offered. Cooking compartments of heavy steel, re-galvanized after fabrication or with stainless steel interior finish, may be ordered. Several types of steaming baskets are available. Tall baskets are used for tuberous vegetables and the shallow type for greens.

Gas-fired steam pressure cooker in which the steam boiler is an integral part of the unit

Attractive dining room of Dwight's Restaurant in Euclid Beach Park on Lake Erie near Cleveland, where the gas cooker is doing yeoman service

In addition to vegetables, meats, fowl, fish, eggs, custards, dumplings and many other items are improved when cooked by steaming. This process provides better retention of food nutrients and minerals, producing more wholesome and fresh appearing food. Shrinkage is substantially reduced and fuel consumption more than halved as compared to range top operation.

In addition, the steamer has auxiliary uses such as:

Cooking frozen foods
Pre-cooking roasts
Heating up canned food
Re-heating various foods
Canning fruits and vegetables

Simplicity, flexibility, economy and quality results sum up the advantages of the gas-operated steamer. A large potential field for such equipment exists in the many food service establishments serviced by natural, mixed and manufactured gases. This field, where the need for improvement and development is evident, is a challenge to the gas industry, and specialized functional equipment such as steamers, ovens and friers will provide many of the answers.

Mass Feeding Operations

OVER 45,000 meals a day are served to sailors at the U. S. Naval Personnel Separation Center at Long Beach, L. I. It is here that the 3rd Naval District conducts its discharge facilities for the thousands of sailors being returned to civil life in this area. Gas fired cooking equipment, ranges, deep fat fryers and bake ovens are used at this station, or rather we should say, on the U.S.S. Lido Beach.

Another mass feeding operation celebrated its first anniversary recently by serving its 6,350,000th customer. This was at the Boeing Aircraft plant No. 2 where some 20,000 workers a day patronize the cafeteria and the in-plant food service.

Off the Hot Top

OFF THE HOT TOP is the title of a news sheet published by Fenton Kelsey Company which should be of interest to all gas men identified with large volume cooking and baking.

Started early in 1945, it has been sent to gas company users of COOKING FOR PROFIT, also to hotel and restaurant men, to gas cooking equipment manufacturers, distributors and dealers.

Published twice a month and written in a concise readable style, it contains many interesting and newsy items on new equipment, what is going on in the commercial cooking field, previews on pertinent industry matters, and highlights on this phase of the gas industry. It can be had for the asking by addressing Fenton Kelsey Company, 114 South Carroll Street, Madison 3, Wisconsin.

Heated rugs, for chilled feet, will soon be on the market, according to Southern Power & Industry—*Printers' Ink*, Sept. 28

AMERICAN GAS ASSOCIATION

INDUSTRIAL AND COMMERCIAL GAS

ADVERTISING FOR OCTOBER

GENERAL MANUFACTURING

Industrial *GAS* Air Conditioning is benefiting these and other industries. BUSINESS WEEK (Oct. 20)

Could You Use 50,000,000 B.t.u.'s of Heat per Hour per Cubic Foot? MODERN INDUSTRY

GAS precision control helps manufacturer save precious tin—and brings other advantages. INDUSTRIAL HEATING

GAS Fuel burned in an acid bath advances metal pickling technique by years. FACTORY MANAGEMENT & MAINTENANCE

METALS INDUSTRY

You can't fool a foundryman on pot furnace performance—So let's see what they say about modern *GAS* foundry equipment. FOUNDRY

Broaches—Master tools of Mass Production—Precision Heat Treated with *GAS* at Detroit's Commercial Steel Treating Corporation. THE IRON AGE (Oct. 4)

For many important foundry fuel needs . . . *GAS* is unsurpassed. METALS AND ALLOYS

Could You Use 50,000,000 B.t.u.'s of Heat per Hour per Cubic Foot? METAL PROGRESS

GAS precision control helps manufacturer save precious tin—and brings other advantages. STEEL (Oct. 15)

TECHNICAL COLLEGE PUBLICATIONS

GAS and the Business Men of Tomorrow. 17 ENGINEERING COLLEGE PUBLICATIONS

CERAMIC INDUSTRY

Could You Use 50,000,000 B.t.u.'s of Heat per Hour per Cubic Foot? CERAMIC INDUSTRY

GLASS INDUSTRY

How *GAS* nurses X-Ray Tubes to finished manufacture. GLASS INDUSTRY

CHEMICAL FIELD

Could You Use 50,000,000 B.t.u.'s of Heat per Hour per Cubic Foot? CHEMICAL & METALLURGICAL ENGINEERING

Industrial *GAS* Air Conditioning is benefiting these and other industries. CHEMICAL AND ENGINEERING NEWS (Oct. 10)

TEXTILE FIELD

Focussed *GAS* Heat from a Ceramic cell brings to textile operations greater speed, accuracy of control, improved production. TEXTILE WORLD

HOTEL AND RESTAURANT FIELD

Schrafft's busy Times Square Restaurant cooks 5000 meals daily with *GAS*. AMERICAN RESTAURANT

"Our Change to Modern *GAS* Cookery has given us Freedom from Guesswork in Cooking." RESTAURANT MANAGEMENT

At Pittsburgh's Vast Masonic Temple New *GAS* Equipment Cooks for largest Masonic body in North America. HOTEL MANAGEMENT INSTITUTIONS

SCHOOL FIELD

GAS cooks up to 17,000 meals daily at U. S. Naval Training School (WR), New York. NATION'S SCHOOLS

HOSPITAL FIELD

Pittsburgh's Famous Presbyterian Hospital proud of its *GAS* Kitchens. MODERN HOSPITAL

FOOD PROCESSING

Memo to Executives: The Trend is to *GAS* for all Food Processing Operations Requiring Heat. FOOD INDUSTRIES

BAKING FIELD

Bond Bakers secure utmost economy, excellent quality, increased speed of production . . . since selecting *GAS* for Doughnut Baking. BAKERS' HELPER (Oct. 6) BAKERS WEEKLY (Oct. 15)

FOUNTAIN AND RESTAURANT FIELD

Murphy's in McKeesport cooks up to 3500 meals daily with *GAS*. CHAIN STORE AGE (Fountain-Restaurant Section)

NEWSPAPERS, PUBLISHERS, ETC.

1,415,853,000,000 cubic feet of *GAS* used industrially and commercially in year prove the trend is definitely to *GAS*. EDITOR AND PUBLISHER (Sept. 22)

Mass Spectrometric Gas Analysis

BY ERNEST SOLOMON
LOUIS C. RUBIN

Petroleum Research Laboratory, The M. W. Kellogg Co., Jersey City, N. J.

PROBABLY the most remarkable advance of the past few years in the art and science of analysis has been the development of the mass spectrometer as a tool for routine analysis. The application of the mass spectrometer to analysis is by no means new. That forerunner of the modern mass spectrometer, the positive ray apparatus of J. J. Thomson, demonstrated some thirty years ago the existence of the mass 20 and 22 isotopes of neon and permitted an estimate to be made of their relative abundances. However, the application of the mass spectrometer to the quantitative analysis of multicomponent mixtures, of other than isotopes, is a very recent development. It is only in the past two years that the mass spectrometer has graduated from the university laboratory, where it was employed in solving abstruse problems in nuclear physics, to the industrial laboratory where it is used in routine analysis.

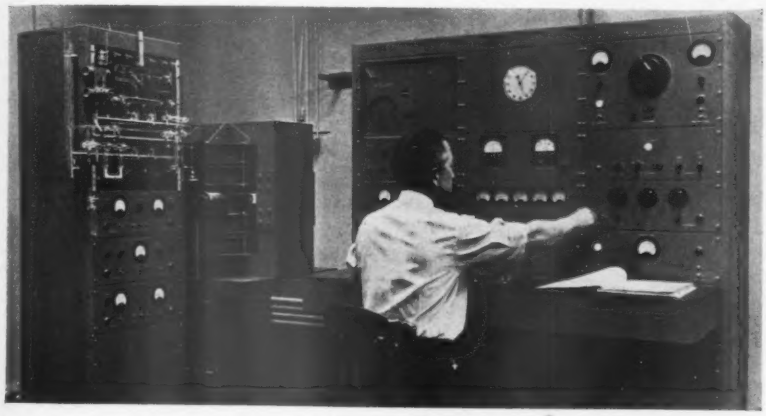


Fig. 1. Typical installation of consolidated mass spectrometer

Two commercial mass spectrometers are available that have been developed for the specific purpose of providing a rapid and accurate means for the routine analysis of complex gas mixtures. Up to the present, these instruments have been used largely for the analysis of fixed gas and hydrocarbon mixtures but there is no reason to doubt their ever-widening application to the analysis of other types of gases, of volatile liquids and, by the application of special techniques, to non-volatile materials.

The instruments manufactured by the Consolidated Engineering Corporation and by the Westinghouse Electric and Manufacturing Co. differ in many important respects but their basic principles are sufficiently similar so that consideration of the Consolidated instrument (Figure 1) will suffice for purposes of illustration.

Figure 2 is a diagrammatic sketch of the heart of the Consolidated mass spectrometer, which is of the Dempster or 180° type. An electrically heated filament A acts as a source of electrons that are accelerated by applying a definite voltage difference between A and B. The rapidly moving electrons pass through a slit in B and bombard the molecules of the gas that have entered the ionization chamber from the inlet sample bottle, the collision of the electrons with the molecules resulting in the formation of positive ions. In addition to positive ions of the same mass as the parent molecule, there may be formed a number of positively charged fragments, and the corresponding neutral fragments. For any given gas the fragments depend, in general, upon the number and type of the atoms in the molecule, the relative abundance of the various fragments depending upon the structure of the molecule. For example, normal butane and isobutane both yield positive ions of the following structures; C_4H_{10}, C_4H_9, C_4H_7, C_4H_6, C_4H_5, C_4H_4, C_4H_3, C_4H_2, C_4H, C_4, C_3H_7, C_3H_6, C_3H_5, - - -, CH, C and H, but the relative abundance of these ions is characteristic of the individual isomer.

The positively charged ions are drawn through the slit at C and accelerated through the slit at D by a difference of potential of about 500 to 3000 volts, the magnitude of the acceleration being determined by this potential difference. The beam of ions defined by the two slits enters the analyzer tube, which is placed in a magnetic field perpendicular to the plane of the figure. All the ions of a given mass, and therefore of the same momentum, are deflected to the same extent by the magnetic field and travel in a semi-circular path. At a definite and calculable magnetic field and ion velocity, all the ions of a particular mass travel in a path of the proper radius to pass through the slit at E and impinge on the target T. The current imparted to the target circuit by the stream of ions is amplified many-fold and recorded on a moving strip of sensitized paper by a light beam reflected from a galvanometer mirror, the deflection of the galvanometer being proportional to the abundance of the ions. By maintaining a constant magnetic field and varying the accelerating voltage continuously, the various streams of ions of different mass are made to pass in turn past slit E, a permanent record being obtained of the relative amounts of these ions. This is referred to as scanning the mass spectrum.

Presented by
CHEMICAL COMMITTEE
DR. C. WILSON
Chairman

A reproduction of mass spectrum of a C_3 through C_4 paraffin-olefin mixture is given in Figure 3. It will be noted that four galvanometer traces appear on the record. Four galvanometers whose sensitivity ratios are 1, 1/3, 1/10, and 1/30 are employed in order to cover a wide range of ion current with no loss of accuracy in reading.

The mass spectrum of a mixture is the sum of the mass spectra of the individual components of the mixture on a mol percentage basis. Having obtained on the mass spectrometer the mass spectra of all the pure components as well as the mass spectrum of the mixture whose composition is to be determined, a relatively simple mathematical treatment results in a breakdown of the mixture spectrum into its component spectra and, therefore, of the mixture into its components. Usually all the peaks recorded in the spec-

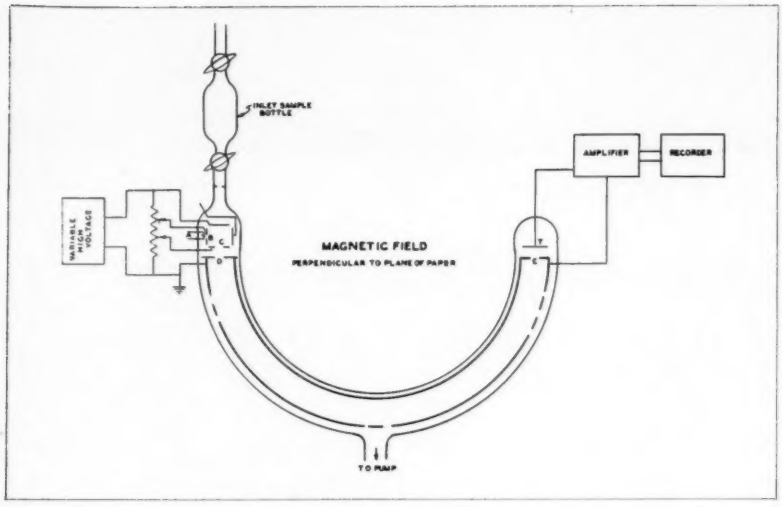


Fig. 2. Diagram of mass spectrometer

trum of the mixture are not needed for an analysis and the remaining peaks may be used to provide an internal check on the accuracy and consistency of the analysis.

It is frequently possible to determine a single component in a mixture without making a detailed analysis, particularly if the constituent to be determined is of higher mass than the other components. In addition, certain compounds can be determined independently of the rest of the components; for example hydrogen, oxygen, methane, ethane, propane, and benzene, can be readily determined in their mixtures with hydrocarbons without going through the detailed mathematical analysis of the spectrum required for a full analysis. In many instances it is possible to obtain an approximate analysis, sufficiently precise for control purposes, of even a complex mixture by visual examination of the record and a brief mental calculation; in such a case the record may be preserved for a detailed calculation at a later date.

The analysis of a number of synthetic mixtures of light hydrocarbons are given in Table I. The synthetic mixtures are of accurately known composition. The analyses were made in the normal routine manner, and may therefore be taken as representative of normal analyses.

An interesting analysis is given in Table II, on the natural gas from a Texas helium well. The analysis was made by Dr. E. K. Brewer of the National Bureau of Standards with a Consolidated Engineering Corporation mass spectrometer. The deviations listed are from the average of two independent analyses that were made with particular care and are indicative of the reproducibility of the method. The trace concentration of hydrogen was confirmed by an analysis of a helium concentrate which was shown to contain 1.64 mol % of hydrogen.

On the basis of experience gained from the examination of a large number of analyses, a method has been devised for the a priori computation of the probable error in the determination of any individual components, in any multicomponent mixture, given the spectra of the individual components. The probable accuracy of the analysis of a mixture similar in composition to a coal gas is given in Table III.

The elapsed time for such an analysis would probably be about 75 minutes. If only the oxygen, hydrogen, methane, ethane, propadiene and propane were to be determined, the elapsed time would be cut to about 40 minutes. About 1.5 man-hours would be required for the detailed analysis, pro-rating the required calibration time, and assuming that a series of such analyses were scheduled.

Using the methods outlined above, it is possible to analyze multicomponent gas mixtures with remarkable speed and accuracy. A complete analysis of a 13 component mixture containing hydrogen, oxygen, nitrogen, and all the paraffins and olefins through the butanes, takes about 1.5 hours of elapsed time of which 20 minutes is instrument time and the remainder calculating time; about 2.5 pro-rated man-hours covering calibrations and maintenance are required for such an analysis. If a number of similar samples are being run the prorated time drops appreciably. A single instrument can very readily handle in a 48-hour work week about 85 such analyses; as the working hours are extended the number of analyses mounts rapidly. One laboratory reports making 800 control analyses per month, of less complex mixtures, at a cost of about 800 man-hours.

Personnel requirements for the normal level of operation in the M. W. Kellogg Petroleum Research Laboratory are a supervisor, one operator and two or three calculators. This staff is responsible for maintenance, repairs, and the devising of new techniques and methods. With this staff an average of about 220 analyses per month has been maintained with less than 200 hours of instrument time, at a cost of about 700 man-hours per month. This is for a research laboratory where detailed analyses of a wide variety of gases are required. In a control laboratory, the number of analyses may be several-fold as large for the same number of man-hours, due to the large saving in calculation and calibration time.

TABLE II

Component	*Mole Per Cent*
Hydrogen	Trace[a]
Helium	2.24 ± 0.02[b]
Neon	0.12 ± 0.01
Nitrogen	23.60 ± 0 05
Argon	0.18 ± 0.01
Carbon Dioxide	0.52 ± 0.05
Oxygen	0.01 ± 0.005
Methane	66.16 ± 0.02
Ethane	3.61 ± 0.02
Propane	2.17 ± 0.02
n-Butane	0.85 ± 0.01
Pentanes	0.36 ± 0.02
Hexanes	0.07 ± 0.02
Heptanes and higher	0.04 ± 0.02

[a] Maximum less than 0.05 mole per cent.
[b] Deviation from average of two independent analyses.

TABLE III

Component	*Concentration Mol %*	*Est. Prob. Error Analysis-Mol %*
Oxygen	0.6	±0.04
Nitrogen	3.4	0.44
Carbon monoxide	6.8	0.76
Carbon dioxide	1.7	0.04
Hydrogen	51.5	0.47
Methane	32.0	0.37
Acetylene	0.5	0.09
Ethylene	1.0	0.07
Ethane	1.0	0.08
Propadiene	0.5	0.03
Propylene	0.5	0.04
Propane	0.5	0.09

TABLE I

MASS SPECTROMETER ANALYSIS OF SYNTHETIC HYDROCARBON MIXTURES

	Synthesis Mol %	*Analysis Mol %*	*Synthesis Mol %*	*Analysis Mol %*	*Synthesis Mol %*	*Analysis Mol %*	*Synthesis Mol %*	*Analysis Mol %*
Hydrogen	3.0	3.2	26.1	26.1	—	—	—	—
Methane	10.8	10.3	15.8	15.4	11.3	10.9	13.4	13.7
Ethylene	6.0	5.9	10.2	10.3	1.5	1.7	—	—
Ethane	6.0	5.8	13.1	13.1	22.1	21.4	19.3	19.7
Propylene	11.1	11.1	24.6	24.7	11.9	11.8	10.2	10.6
Propane	19.2	19.5	10.2	10.2	31.1	31.0	19.8	19.9
Isobutene	2.8	1.6	—	—	4.4	4.7	7.5	8.7
Butene-1	1.5	2.4	—	—	5.0	6.2	5.3	5.3
Butene-2	1.4	1.7	—	—	0.7	0.0	4.7	3.1
Isobutane	20.1	20.0	—	—	5.0	5.0	10.8	10.9
n-Butane	5.0	5.2	—	—	7.0	7.3	9.1	8.6
Pentenes	3.0	3.1	—	—	—	—	—	—
n-Pentane	10.1	10.2	—	—	—	—	—	—

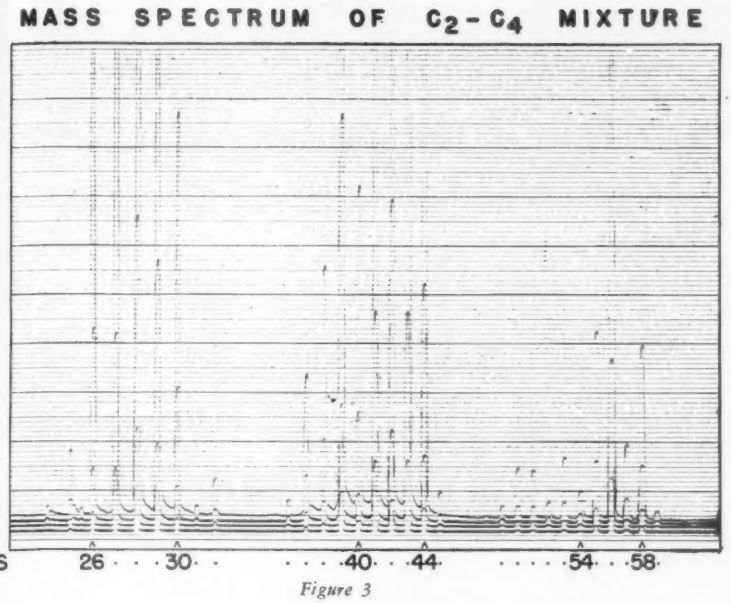


Figure 3

It is evident that a major portion of the man-hours spent on each analysis goes into the mathematical analysis of the data. It is expected that in the near future electrical devices that are at present in the development stage will very appreciably reduce the labor of computation.

The major advantages to the mass spectrometric method of analysis over the conventional methods of analysis are: marked reduction in elapsed time and in man-hours per analysis, complete and detailed analyses with internal checks on accuracy and a check on unsuspected components, lower costs per analysis. It is probable that in the near future no research laboratory dealing with hydrocarbons will be considered adequately equipped unless it contains a mass spectrometer. However, it is in the control laboratory that mass spectrometric analysis, with its speed and accuracy, will undoubtedly prove to be of the greatest value.

BIBLIOGRAPHY

Aston, "Mass Spectra and Isotopes," Longmans, Green & Co., London (1941).
Hipple, Applied Phys. *13*, 551 (1942).
Hipple, Grove and Hickam, Rev. Sci. Inst. *16*, 69 (1945).
Hoover and Washburn, Amer. Inst. Min. and Met. Engrs., Tech. Pubn. 1205 (1940).
Schaafsma, Pet. Eng. *15*, 136 (1944).
Stevenson and Hipple, J.A.C.S. *64*, 1588 (1942).
Washburn, Wiley and Rock, Ind. Eng. Chem. (Anal. Ed.) *15*, 541 (1943).
Washburn, Wiley, Rock and Berry, Ind. Eng. Chem. (Anal. Ed.) *17*, 74 (1945).

GAS PRODUCTION RESEARCH

(Continued from page 426)

pulverized coal gasification available to the Technical Advisory Committee. Their work was done on a pilot plant at Battelle Memorial Institute, it was most interesting and will be of service in guiding the work at the Institute of Gas Technology on Flash Gasification.

Plant Operation

In addition to the work being done by Mr. Willien and Mr. Hartzel on Plant Apparatus, P. T. Dashiell has completed some tests on modern water gas sets and will shortly be able to supply information regarding the costs, capacities and operating results that may be obtained with this equipment. The committee has been promised three other papers that will describe the methods used in the past few years in three other plants for increasing plant capacity and plant flexibility.

Other Processes

Of the processes that have been studied by the Institute or that have been called to the committee's attention by other sources, the two most promising are the "Lurgi" process and a possible modification of catalytic cracking in conjunction with a turbulent or fluidized fuel bed.

The Lurgi process is used in Germany for the production of town gas of not over 500 B.t.u. per cubic ft. from lignite. This process is operated at 20 to 30 atm. pressure, relatively large quantities of carbon dioxide are produced and the carbon dioxide and any hydrogen sulfide produced are scrubbed from the gas, the resulting gas is of 480 B.t.u. and .45 sp. gr. The process was used in Germany before the war and may have been improved during the war years.

The United States Bureau of Mines is interested in this process, and one private contracting firm is quite interested. The Gas Production Research Committee is endeavoring to combine the interest of the Bureau of Mines, the private contractor and its own interests in a common project that will start with the reports that should be available when various technical missions have returned with their studies of German processes.

The use of fluidized solids for the catalyst treatment of hydrocarbon oils has been developed into a commercial process that is used by many oil companies. The Institute of Gas Technology had previously proposed this method of gasifying coal or coke. In order to determine the possible cost of operating a commercial plant and in order to determine the cost of installation and operation of a pilot plant, the committee has authorized more detailed studies by the Institute. The committee is also trying to interest a private engineering firm in the application of their knowledge of fluid cracking to this problem.

The Lurgi process requires oxygen for its operation, and the fluidization process might be operated with oxygen, for this reason the committee has been quite interested in plants for oxygen production and has obtained estimates from reliable sources as to the cost of oxygen plants of various sizes.

Safety Record

ONLY one lost time accident in approximately 400,000 hours of work is the record attributed to the annual August safety campaign conducted by employees of the Manufacturers Light & Heat Co. and affiliated natural gas companies in Pittsburgh, Pa.

In announcing this remarkable safety record, W. H. Adams, safety director of the company, observed that it duplicated the record made in the annual drive of a year ago. In the 1944 campaign only one injury caused working time to be lost.

Mr. Adams feels that the splendid safety record is due, in part, to a campaign to have natural gas users eliminate safety hazards from their premises. He also credits as responsible to a great degree, the daily safety meetings, reminder bulletins, buttons, etc.

Balancing Oven Performance

BY H. J. HENSE

American Gas Association Testing Laboratories

UNIFORM baking performance of the domestic gas range is a subject close to the hearts and the palates of American housewives and consequently of vital interest to members of the gas industry. Technically, the design factors blending to produce uniform oven heat distribution, if not quite as numerous as those affecting the human heart, are at least as difficult of diagnosis and control. Since successful "balancing" of these variables for superior baking performance goes far towards enlisting the interest of housewives and making new friends, manufacturers in particular may well be interested in a forthcoming domestic gas research bulletin on the subject.

Based upon extensive research at the American Gas Association Testing Laboratories, undertaken in order to chart the magnitude of oven construction and operating changes generally known to influence heat distribution as well as to analyze a number of lesser known factors, the bulletin, "Oven Heat Distribution in Domestic Gas Ranges," should prove valuable to designers and manufacturers in the solution of their oven problems. Representing the tenth in a series devoted to research in domestic gas cooking sponsored by the American Gas Association's Committee on Domestic Gas Research, the new publication is the first to be devoted exclusively to heat distribution in ovens. It is closely identified with contemporary range design as typified by representative models.

Wealth of Practical Data

The fundamental nature of the research conducted establishes a solid foundation for additional technical advances. At the same time a wealth of practical data of immediate value is provided indicating what can logically be expected of certain types of specific changes. The probable effect of numerous constructional and operating considerations which have been discussed from time to time purely from a theoretical point of view likewise have been investigated and clarified.

The importance of the study both from the standpoint of providing a basis for future research and immediate practical application is emphasized by past experience at the Laboratories in examination of ranges submitted for test and approval. In instances where difficulty is experienced in meeting the standard cake baking test as currently applied, some form of design change is often necessary to improve heat distribution. With very little data available as to the specific change necessary to provide more balanced distribution of heat or give more or less heat in certain areas, considerable experimentation as a rule is necessary before the correct clue to satisfactory performance is discovered.

Due to the many types and sizes of contemporary oven construction, it was necessary to limit research findings to charting trends. Various combinations of design components associated together quite naturally affected the reaction to a specific change. In numerous instances similar effects but of varying degree are obtained, while in others the result is in the opposite direction. In presenting the data, however, unique charts were devised showing directly in terms of light reflectance average variations in the color of

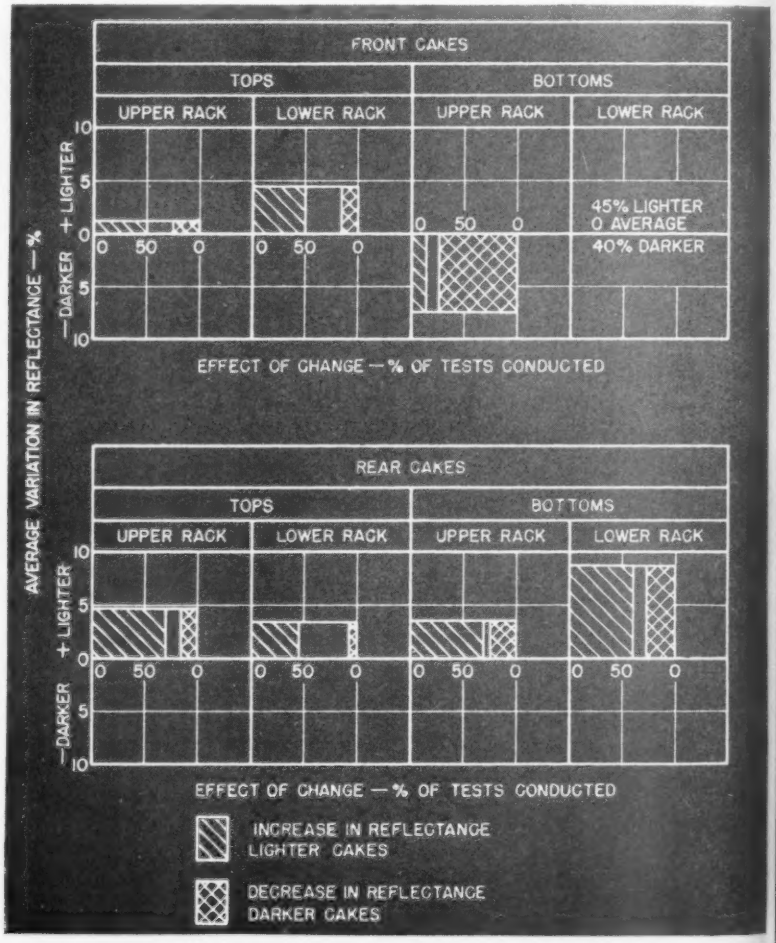


Fig. 1. Typical chart showing effects on cake surfaces in all rack positions of change in oven bottom side opening. Width of hatching shows percentage of tests in each classification

test cake surfaces produced by specific changes, the means employed in testing and the percentage of tests resulting in lighter and darker cakes. Seventeen types of construction changes are thus charted.

Using the data developed, anyone desiring to bring about a redistribution of oven heat in all likelihood can determine his own type of application either on the basis of matching past experience with the charts or discovering the basic nature of his own appliance after relatively few tests. Fig. 1 shows a typical chart arrangement. Note that front and rear cakes are analyzed separately with complete data given for the tops and bottoms of cakes on each rack. Hatching and cross hatching distinguishes respectively lighter and darker cake surfaces with the result plotted above or below the reference line in accordance with whichever predominated percentagewise. While the charts depict color trends resulting from a construction change in only one direction, a change in the opposite direction will produce the opposite effect.

Color Chart Furnished

To the wealth of detailed information contained in these charts, two important additional practical aids to the solution of oven heat distribution problems are included in the research bulletin. One is a color chart prepared from cake samples of different degrees of "brownness," calibrated in terms of light reflectance ranging from 25% to 60% or approximately the allowable minimum and maximum specified by current gas range approval requirements. The other is a "paper" cake method of determining uniformity of heat distribution. The color chart includes a series of "paper" cake reflectances coordinated with the actual cake samples. These may prove useful where the conduct of a considerable number of tests is required as is often the case during experimental or development work. They also enable color quality to be generally established without use of a reflectometer.

Fig. 3. Cutting samples from tops and bottoms of test cakes for color measurement

Experience shows that only a very small difference in the range of overall case reflectances often has stood between success and failure while changes necessary for correction frequently have been found difficult to establish and in numerous instances have required either costly alterations or modifications disturbing other design components or styling. With the overall range of cake surface reflectances and that of those on any one rack limited to 26% and 18% respectively between the fixed limits set for light and dark surfaces, proper balancing is difficult in view of the fact that differences in cake color of less than five or six per cent are not discernable to the human eye.

In practice changes made to obtain better balance include experimentation with oven bottom openings, bottom insulation, flue outlet conditions, thermostat bulb location, positioning of burner and rack locations. A number of such changes are often difficult of accomplishment to the extent necessary to produce the results desired. Basic data made available through painstaking study now provide means for minimizing the number of changes and reducing the amount of experimentations in addition to helping to coordinate variables in original design. It well may be that some types of construction not now commonly employed will be found to be both beneficial and economical from an overall design standpoint. For example one of the most effective means of producing heat distribution changes was found to consist in the use of a number of small openings distributed over the oven top instead of one large opening as commonly employed. Appreciable difference in oven performance also accompanied raising of oven side wall openings. Such changes are an expensive process once design has been frozen. Likewise change of burner location is a major technical operation and change of rack height involves expensive die changes.

Other construction factors included the finding that cakes baked in ovens controlled by

Fig. 2. Paper disc "cakes" developed as a means of judging oven heat distribution without actual baking. A color chart establishes general conformance with requirements for both paper and actual cakes

snap-acting thermostats compared favorably with those baked under conventional graduating thermostatic control, that polished or dull interior oven surfaces do not effect heat distribution, and that changes in gas input rate to the oven have very little effect except at rates too low to maintain baking temperature.

In some quarters it has been felt that ranges should be level for proper performance or that at least the oven racks should be level. It was proven that tilting the ranges by elevating one side produced little effect unless the tilting was extreme. Tilting from front to back or vice versa, however, indicated that care should be exercised to install ranges in a level position. The opinion has also been held that better heat distribution would follow improved sealing of oven doors. Experimental passage of variable amounts of flue gases around oven doors definitely altered the pattern of heat distribution. However, the change did not follow a definite trend, resulting sometimes in better and sometimes poorer distribution.

Within reasonable limits variations in composition or temperature of the cake batter or the weight of the batter per cake did not affect cake color. Cakes baked from a cold start compared favorably with those baked in a preheated oven providing the time of baking was somewhat increased. Extending the time of baking in any event was found to bring tops and bottoms of cakes nearer the same color while it was also found that satisfactory heat distribution for standard test cakes is sufficiently flexible to produce good quality baked goods of any type.

On the whole the critical nature of oven "balancing" from the design standpoint, coupled with the fact that success or failure of a particular design to bake uniformly often depends upon a very small change in overall reflectance measurements, emphasizes the importance of any study or development which will expand present knowledge. In definitely evaluating for the first time the effects of all types of oven constructional changes on contemporary design as well as providing visual aids to help designers and manufacturers, much progress has been made. Results of research presented in the new bulletin provide practical means of advancing the technique of range design and elevating still further the high standard of performance of contemporary models.

General Arnold Praises Laboratories' War Accomplishments

OFFICIAL recognition of the importance of American Gas Association Testing Laboratories' war services towards final Allied victory is contained in the following communication from Commanding General Henry H. Arnold of the Army Air Forces.

"V-J Day has, to the boon of all free peoples, followed V-E Day by a few months. On this first official day of Peace our fondest hopes since 7 December 1941 are victoriously realized. As I look back over the events that have led to such a completely successful victory over the Germans and the Japanese, I must salute you and the employees of American Gas Association in your plant in Cleveland who, by providing the Army Air Forces with oxygen equipment, played such an important part in its realization. I am proud and gratified by the magnificent cooperation you gave us through the war years and extend to you my own sincere thanks and those of the Army Air Forces.

"I commend every one of you and wish you the best of luck in the years of Peace to come."

General Arnold's letter refers primarily to the development by the Laboratories of the A-11 automatic oxygen regulator, a new and original design for supplying passengers in transports and troop ships with correct amounts of oxygen at various altitudes. Prior to its development, devices for this particular purpose were not available. The letter augments two others in the war services file. James B. Conant, acting director of the Office of Scientific Research and Development, previously praised the unusual efficiency and dispatch with which studies of subjects of military importance had been performed. The Army Air Forces Materiel Center likewise commended the Laboratories by placing them on the Quality Control Classification "A" List soon after the start of A-11 production.

It is expected that by October 1, the beginning of the new Association year, the A-11 contract will have been largely completed as well as all other pending war development and research contracts, thus leaving the Laboratories free to concentrate their efforts on their normal testing, inspection and research activities. This should aid materially reconversion to a peace-time economy by manufacturers and help them to get new models of gas appliances on the market at an early date. Every effort is being made to provide the speediest possible service.

Recent delivery was made to the Navy of units of another indicating war device used in fire control work, this completing the Laboratories Navy contracts. Altogether 14 separate and distinctive devices were developed and designed by the Laboratories in the war service program. The A-11 regulator was the outstanding accomplishment.

Laboratories Plan Annual Inspections

MANUFACTURERS of gas appliances have been notified by the American Gas Association Testing Laboratories that annual inspections of approved appliances in production will be started soon.

According to R. M. Conner, director, a number of inspections this year may be made somewhat later than usual in order to give time for the process of reconversion to peacetime appliance production. It is expected that several months will be required to carry out the entire annual inspection program.

Approval of appliances found in the field to comply fully with Laboratories' records will be renewed for the year 1946. The majority of inspections will be made from the Cleveland Laboratories and the remainder from the Pacific Coast Branch. Ample advance notice will be given manufacturers so that mutually satisfactory arrangements can be made.

In addition to factory visits, inspections will be made in warehouses where appliances are stored, in department stores and on dealers' sales floors. Calls are also occasionally paid to consumers' homes for the purpose of checking not only individual appliances but their installation as well.

Widely Known Engineer Joins A. G. A. Laboratories

Chester A. Thorp

A TOP-FLIGHT gas utilization engineer, Chester A. Thorp, will join the staff of the American Gas Association Testing Laboratories on October 15 in an administrative capacity, according to R. M. Conner, director.

Widely known to the California gas industry and to others interested in appliance testing and research activities, Mr. Thorp goes to the Laboratories after 3 years in the Navy. A graduate chemical engineer with more than 20 years' experience in the gas industry, he formerly headed the Gas Appliance Laboratory of Southern California Gas Company and Southern Counties Gas Company of California.

A graduate of Stanford University in 1922, Mr. Thorp joined the Pacific Gas and Electric Company in 1924 as a cadet engineer after a year's sales work with the Standard Oil Company. In 1926 he became associated with the Los Angeles Gas and Electric Corp. as chief chemist and shortly afterwards entered its sales department where he was engaged in industrial gas sales for approximately 10 years.

With the consolidation of Los Angeles Gas and Electric Corp. into the Southern California Gas Company, Mr. Thorp undertook an extensive market analysis study for the combined system. Following its completion he assumed charge of the gas appliance laboratory maintained jointly by his own company and the Southern Counties organization. Retaining this position until entering the Navy in 1942, Mr. Thorp gained wide experience of particular significance in his new position.

Mr. Thorp was commissioned in the Navy as a Lieutenant and was soon promoted to Lt. Commander. During the past 3 years he has been assigned to administrative duties in connection with ordinance contracts in Newport, Rhode Island, Washington, D. C., Canton, Ohio and Bloomington, Indiana.

Personal and Otherwise

Elected Vice-President of Consolidated Edison

E. F. Jeffe

BRIGADIER General E. F. Jeffe of Washington, D. C., who left Consolidated Edison Company of New York in May, 1942, to enter military service, was elected vice-president of company on September 25. He will be in charge of sales activities. L. A. Scofield, general sales manager, was elected assistant vice-president. N. T. Sellman, formerly assistant vice-president, has resigned and will give his entire time to his duties with Westchester Lighting Company, where he is first vice-president.

During the war Mr. Jeffe returned to the Signal Corps, where he had served in the first world war, as a Major, becoming successively Lieutenant Colonel and Colonel, and in June, 1944, Brigadier General. In February, 1943, he was appointed executive assistant to the executive vice-chairman of the War Production Board and in June of that year executive secretary and a member of the Production Executive Committee of the Board, holding these places until October, 1944. For his services with the War Production Board he received the Legion of Merit Medal.

New A. G. A. Directors

J. N. Greene, president, Alabama Gas Company, Birmingham, has been elected a director of the American Gas Association, to fill a vacancy until November 8, 1945, caused by the resignation of H. Carl Wolf, who becomes managing director of the Association on October 1.

Henry Fink, vice-president and general manager, Michigan Consolidated Gas Company, Detroit, was elected a director to fill the unexpired term ending October 31, 1946, caused by the death of John W. Batten, former president of the Michigan Consolidated Gas Company.

Peterson Promoted

PROMOTION of Donald W. Peterson of the Minneapolis Gas Light Co., Minneapolis, Minn., to the position of secretary and assistant treasurer was announced Sept. 16 by Harry K. Wrench, president and general manager of the company. He succeeds the late Maurice D. Read who died Sept. 1.

Mr. Peterson has been assistant secretary and assistant treasurer the last eight years. He joined the firm 16 years ago as a bookkeeper in the accounting department.

H. C. Wehnert Retires, Laclede Men Promoted

H. C. WEHNERT, chief engineer of the Laclede Gas Company of St. Louis, Missouri, for the past twenty years, resigned his position on October 1, 1945. On Monday, September 24, he was presented with an engraved gold watch and chain at a dinner given by the department heads and officials of the company at the Statler Hotel.

Mr. Wehnert went to Laclede in 1906 as a cadet engineer, soon after his graduation from Purdue University. His resignation has occasioned several promotions in the supervisory staff of the manufacturing department of the company.

John H. Doerres, who has been superintendent of Laclede's by-product coke station for twenty years has been appointed to succeed Mr. Wehnert. He went to Laclede in 1913, a graduate of Ohio State University. Erwin Blind, who has been assistant to Mr. Doerres has been appointed to fill the former position of Mr. Doerres.

Other appointments include: E. L. Horner, superintendent of manufacture; Dave Turk, superintendent of water gas manufacture; G. B. Brothers, assistant superintendent of water gas manufacture. These men are all veterans in the Laclede organization.

Elected Vice-President of Standard Equipment

Herbert C. Erhard

HERBERT C. ERHARD, general sales manager of Standard Gas Equipment Corp., Baltimore, Md., has been elevated to vice-president in charge of sales. He will have complete direction of sales, advertising and promotion programs.

A graduate of Columbia University, Mr. Erhard has been associated with the gas appliance business for more than 30 years. He joined Standard Gas Equipment in 1924.

He is a member of American Gas Association and has been active in industry affairs. He has served on W.P.B.'s Commercial Cooking Industry Advisory Committee and the Special Projects Committee of A. G. A. E. M. which recently framed the postwar program for the "CP" Managing Committee.

Beckjord President of Cincinnati Gas Blackwell Becomes Board Chairman

Walter C. Beckjord

RETIREMENT of H. C. Blackwell as president and his election as chairman of the board of Cincinnati Gas and Electric Company was announced following a meeting of the board of directors on September 10. Walter C. Beckjord, a member of the company's board for the past 11 years, was elected president. Mr. Beckjord has been president and director of Columbia Engineering Corp. and vice-president and director of Columbia Gas and Electric Corp., as well as a director of Dayton Power & Light Co., Dayton, Ohio.

The new head of Cincinnati Gas and Electric Co., Mr. Beckjord is an executive of wide experience in the gas and electric fields, having taken an active part in the national associations of both industries. In addition to being a member of the Executive Board of the American Gas Association and active on many important committees in the past, he served as president of the Association in 1940.

Born in Minnesota, Mr. Beckjord graduated as an electrical engineer from the University of Minnesota in 1909 and entered the utility business the same year with the St. Paul Gas Light Co., a subsidiary of the American Light & Traction Co., of which he later became vice-president and chief engineer. In 1930, he became vice-president and general manager of the Boston Consolidated Gas Co., Boston, Mass., leaving there in 1934 to join the Columbia Gas & Electric Corp. as vice-president and general manager.

Mr. Blackwell went to Cincinnati from Kansas City, Missouri, in 1924, as vice-president and general manager of the local companies. He entered the public utility field as engineer with the People's Light Co., of Davenport, Iowa, in 1906. He became vice-president and general manager of that company, and in 1917 became vice-president and general manager of the Kansas City Power & Light Co.

Mr. Blackwell has been active within the associations representing the public utility industry and has served as president of the Association of Edison Illuminating Companies since 1941. This association ranks as the oldest of such organizations in the electrical field.

Taber Elected President of Atlanta Gas Light Co

ROCK GRANITE TABER, operating vice-president of Atlanta Gas Light Company, Atlanta, Ga., has been elected president of the company effective October 1, following the resignation of H. Carl Wolf to become managing director of the American Gas Association. Mr. Taber joined the Atlanta utility in 1944. Prior to that time he was vice-president of Stone & Webster Service Corp. with whom he had been connected for 37 years in various public utility departments.

Member New Jersey Utility Commission

DLANE POWERS resigned from Congress, effective August 30, to become a member of the New Jersey public utility commission. A Trenton Republican, Mr. Powers was appointed to the state agency in April by Gov. Walter E. Edge.

Smith Leaves Selas To Join Agency

Harry W. Smith, Jr.

HARRY W. SMITH, JR., well known to the gas industry through his work as advertising manager of Selas Corporation of America (1941-45), director of publicity for the Industrial and Commercial Gas Section of the A. G. A. (1938-41), and research engineer and publications man for the A. G. A. Testing Laboratories in both Cleveland and Los Angeles (1931-36), announces affiliation with The John Mather Lupton Company, advertising agency, 420 Lexington Avenue, New York City, beginning October first. He will serve as vice-president.

At Lupton he will work primarily on stainless steel, metallurgical, chemical and industrial publishing accounts—in addition to general managerial duties.

Both with Selas and the A. G. A., Mr. Smith has made notable progress in acquainting American industry with improved and modern technologies of process heating with gas—utilizing programs for engineering groups, trade show displays, and technical feature articles to an unusual degree—in addition to the usual machinery of publicity and advertising.

A graduate of Case School of Applied Science in Physics (1930) and a teaching fellow at Princeton University in mathematics (1931), he has also worked with General Electric, the Bell Telephone Laboratories and The New Jersey Zinc Company. His memberships include: Poor Richard Club, National Industrial Advertisers (vice-president, Philadelphia Chapter), American Society of Mechanical Engineers (chairman, Industrial Furnaces & Kilns Committee), Sigma Xi, Tau Beta Pi, Beta Theta Pi, American Marketing Association, and American Gas Association.

Irwin Promoted

K. M. IRWIN has been appointed manager of the Engineering Department of the Philadelphia Electric Company and subsidiary companies. He was previously assistant to the vice-president in charge of engineering.

Mr. Irwin is well known in electrical engineering circles and has served on many national committees of various utility associations. Last year he was appointed through the Office of War Utilities, of the War Production Board, to the position of executive director of the London Staff, Public Utility Committee, of the Combined Production and Resources Board, and in this capacity made important contributions to the restoration of utility service in Northwest Europe.

Brewer Reelected

ORVILLE W. BREWER, controller of the American Gas Association, was re-elected treasurer of the Controllers Institute of America at that organization's annual meeting held September 24 at the Stevens Hotel in Chicago. It is his fifteenth consecutive term in office.

Edmunds Selected for P. C. G. A. Presidency

H. W. Edmunds

H. W. EDMUNDS, vice-president and general manager, Coast Counties Gas and Electric Co., has been selected by the Nominating Committee for the presidency of the Pacific Coast Gas Association. LeRoy M. Edwards, vice-president and general manager, Pacific Lighting Corp., is slated to become vice-president and D. G. Martin, general auditor, Pacific Gas and Electric Co., has been chosen for treasurer. Elections take place during the annual meeting to be held Oct. 3 and 4 at Del Monte Lodge.

New directors named by the Nominating Committee include: H. W. Geyer, utilization engineer, Southern Counties Gas Co.; M. A. Pooler, president, Tucson Gas, Electric Light & Power Co.; E. D. Sherwin, vice-president in charge of operation, San Diego Gas & Electric Co.; and E. H. Sutton, president, Mission Water Heater Company.

Hull Joins Meter-Valve Firm

Waldo S. Hull

WALDO S. HULL has joined the sales division of the Pittsburgh Equitable Meter Company-Merco Nordstrom Valve Company, according to an announcement by A. J. Kerr, general sales manager.

Mr. Hull was associated with the Central New York Power Corporation of the Niagara Hudson System from January 1927 to October 1942. He worked in the gas department of the Utica Area for this entire period, serving as superintendent of gas transmission and regulation until being called to the War Production Board, Office of War Utilities, in Washington in October 1942.

In the Office of War Utilities Mr. Hull served as senior industrial engineer in the Gas Materials Section, Gas Division. He was concerned largely with assigning priority ratings, assisting the gas industry to secure critical materials during war-time.

In his new connection he will handle the sales and service of Emco gas meters and regulators, and Nordstrom lubricated valves in the Philadelphia and Washington trading area. Mr. Hull will make his home in Philadelphia, Pa.

A. G. A. Employee Wins Navy Medal for Heroism

John J. Ryan

JOHN J. RYAN, quartermaster, first class, in the United States Naval Reserve, and a member of headquarters personnel of the American Gas Association for nine years prior to his entry into the service in 1942, has been awarded the Navy and Marine Corps Medal. The action for which he was honored took place January 12, 1945, when an American mine sweeper struck a mine and sank and an infantry landing craft on which he was stationed performed heroic work in rescuing survivors.

In presenting the medal to Quartermaster Ryan, the following citation was read by Rear Admiral John Wilkes:

"For heroism in rescuing men from a sinking ship. He swam to a sinking ship through mined and shark-infested waters through heavy swells, and his coolness and courage in directing rescue work resulted in the saving of many lives. His heroic conduct, performed in the face of great danger to himself, was in keeping with the highest traditions of the United States Naval Service."

Manly Resigns from F. P. C.

ACCEPTANCE by the President of his resignation as chairman of the Federal Power Commission was announced Sept. 12 by Basil Manly, long a resident of Washington, D. C.

Mr. Manly has had an extended career in Government service, having been director of the Commission on Industrial Relations in 1914-1915 and joint chairman with former President William Howard Taft, of the National War Labor Board during the latter part of World War I.

He was appointed to the Federal Power Commission in 1933 by President Roosevelt. He was elected chairman by his associate Commissioners after having served a number of years as vice-chairman.

Col. Tappan Returns To Stove Company

COL. ALAN P. TAPPAN has hung up his military uniform, donned civilian clothes, and has resumed his pre-war duties as vice-president and general manager of the Tappan Stove Company after serving in the Army Air Forces since July 18, 1942. He is on terminal leave which expires Nov. 15.

Colonel Tappan entered service as a captain in the procurement division of the A.A.F. and was first stationed at Wright Field, Dayton. He went to England late in 1942 and while there was advanced to major.

In the fall of 1943, he returned to the United States and was commissioned lieutenant colonel. He was promoted to full colonel in March 1945.

Colonel Tappan had seen previous service in World War I, when he left Cornell University to serve on the Mexican border as a member of Co. "M" Eighth Ohio infantry of the Ohio National Guard. He was later transferred to the air corps and commissioned a second lieutenant.

In 1919 he became a flight instructor, serving in Texas and California and later on was placed in command of the 312 Flight Squadron at Bolling Field, Washington.

Deke Houlgate Renews Hollywood Contacts

BACK in July of 1942, Deke Houlgate put on the uniform of a lieutenant in the Army Air Forces and became a public relations officer in the Western Flying Training Command. For the six years prior to that, he had represented the American Gas Association and the gas industry as an "ambassador" to Hollywood.

Following a public relations assignment at Las Vegas, Nevada, aerial gunnery school and a brief tour of duty in the Pentagon Building, he was called into the Santa Ana headquarters of WFTC as public relations officer on the staff of Major General Ralph P. Cousins.

In July of this year, Major Houlgate took off his uniform and returned to his old friends in the gas industry and a position with the Southern California Gas Company assisting Vice-President Marion Banks.

In this capacity he will renew old friendships in Hollywood's motion picture and radio industries in addition to representing the Southern California Gas Company in a variety of business and professional circles.

Deke is better known nationally as a leading authority on the game of football, a reputation which grew through the pursuit of a hobby.

In the big promotional days of the late thirties, Deke's activities in Hollywood helped to make modern gas appliances standard props whenever motion picture scripts called for glamour kitchens.

Gilbert on Board

J. C. GILBERT, Santa Monica district manager of Southern Counties Gas Company, has been elected to the company's board of directors, it was announced Sept. 19 by F. S. Wade, president. He fills the vacancy created by the death of Ferdinand R. Bain, chairman of the board and a director of the company since 1911.

Affiliated with Southern Counties since 1918, Mr. Gilbert has served as district manager since March, 1920. He began his career in the gas industry in 1912 when he served as assistant to the manager of the Central Indiana Gas Co. of Muncie, Indiana.

Lt. Grow Returns From India

Lt. Loretta Grow

LT. LORETTA G. GROW, formerly a member of the home service department of the Long Island Lighting Co. at Mineola, N. Y., and the Queensboro Gas and Electric Co. at Far Rockaway, is now stationed at the WAC Det. CRTC, Ft. Riley, Kansas. She recently returned from Ceylon in a five-day airplane trip. It had taken her WAC detachment 49 days to reach Bombay in 1943.

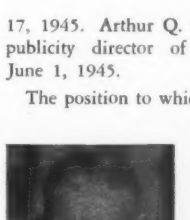
Maintaining her interest in home service activities, Lt. Grow had received the A. G. A. Home Service News since June, 1944. She described the cooking equipment in New Delhi as a far cry from automatic gas cooking. Food was cooked on charcoal burners and one "bearer," whose duty it was to fan the flame to keep the fire going, was assigned to each stove. In Ceylon wood was used for fuel.

Industrial and Commercial Gas Section Makes New Appointments

Mahlon A. Combs

APPOINTMENT of two additional staff members for the Industrial and Commercial Gas Section of the American Gas Association has been announced by J French Robinson, president of the Association. Mahlon A. Combs has been appointed assistant secretary of the section effective September 17, 1945. Arthur Q. Smith has been named publicity director of the section effective June 1, 1945.

The position to which Mr. Combs has been appointed is a newly-created post made necessary by the increased scope of industrial and commercial gas problems and activities. Mr. Smith is reestablishing the publicity service to technical and business magazines which the section carried on so successfully for many years prior to the war.



Arthur Q. Smith

Mr. Combs has had twenty-five years' experience in the gas industry. Upon graduation from Stevens Institute of Technology, he started with Consolidated Gas Company, New York, as a gas utilization engineer and following that he was engaged in industrial gas sales engineering for Maxon Premix Burner Company. For fifteen years he was with American Gas Products Corp. and was general sales engineer of that company when it was absorbed by American Radiator & Standard Sanitary Corp., where he continued as gas house heating and air conditioning engineer.

For a number of years Mr. Combs served on the Gas House Heating and Air Conditioning Committee of the New Jersey Gas Association, and was its chairman for one year. His most recent connection was in the Research and Development Department of American Type Founders Inc., with which concern he also worked in selecting sub-contractors for the production of ordnance products.

Mr. Smith comes to A. G. A. with an overall background of experience in advertising and publicity gained in an advertising agency of which he was a partner for a number of years. Subsequently he was advertising manager of the Commonwealth & Southern Corp., and later with Charles & Co., where he served in a merchandising and advertising capacity. Previous to joining A. G. A., Mr. Smith was with the National Association of Manufacturers on field promotion, public relations and publicity. He received his education in the New York City schools and studied electrical engineering at Columbia University.

Obituary

JOHN L. O'TOOLE, retired vice-president of the Public Service Corporation of New Jersey and a former city editor of The Newark News, died Sept. 9 at the age of 73.

As vice-president in charge of public relations from 1923 to 1942, Mr. O'Toole had served as spokesman for the corporation and its subsidiary companies.

Mr. O'Toole joined the corporation in 1909, when Thomas N. McCarter, now chairman of the board, made him a publicity agent. He later organized the company's present public relations and advertising department. He was elected a director in 1938 and resigned on May 15 of this year because of illness.

His newspaper career began in 1892 with The Newark Times. A year later he joined his brother, the late Peter J. O'Toole, on the staff of The Newark News, specializing in municipal affairs and politics. After eight years as a reporter, he was appointed city editor serving until he joined the Public Service Corporation.

For many years Mr. O'Toole was active in the Newark Chamber of Commerce, serving as its representative at the Chamber of Commerce of the United States. He was a founder and a former president of the Newark Diocesan Federation of Holy Name Societies and a trustee of Our Lady of Good Counsel Roman Catholic Church.

Robert B. Harper

ROBERT B. HARPER, vice-president of The Peoples Gas Light and Coke Co. of Chicago, and one of the most prominent gas chemists and engineers of the country, died August 29.

Mr. Harper played a leading part in formulating plans for the American Gas Association Testing Laboratories, which he helped to direct from their inception to 1941. Representing the gas industry in the American Standards Association, he was instrumental in having 26 basic gas appliance standards accepted as "American Standards." He also cooperated in founding the Institute of Gas Technology.

Mr. Harper received the Walton Clark Gold Medal of The Franklin Institute of Philadelphia in 1938, as an award in recognition of "his leading part in the development, supervision and direction of a research and testing laboratory of outstanding excellence in the gas industry; his cooperation personally, and through members of his staff, with the gas industry generally; and his own distinguished work in the chemistry and physics of the gas industry."

He held the Beal Medal Award, for the most outstanding technical paper presented to the American Gas Association during 1931. In 1933 he was elected a Fellow of the American Association for the Advancement of Science, and in 1936 became a Fellow of the American Institute of Chemists.

Only last year, he was singled out by the American Institute of Chemists to receive the 1944 Honor Scroll presented each year to an outstanding member of the chemical profession.

Mr. Harper was graduated from Armour Institute of Technology in 1905, with a Bachelor of Science degree in chemical engineering, and joined the Peoples Gas organization in June of the same year. He received the advanced degree of Chemical Engineer in 1909.

Beginning as an assistant chemist in a five-man laboratory, of which he became the head within a year, he steadily increased the scope and value of research and testing within his company. At the time of his death, Mr. Harper was directing the operation of eight research and testing departments which are outstanding in their field.

MAURICE D. READ, secretary and assistant treasurer of Minneapolis Gas Light Co., Minneapolis, Minn., died of a heart attack Sept. 1 at the age of 45.

Mr. Read went to Minneapolis in 1935 from Benton Harbor, Mich., where he had been associated with the gas company.

Born September 16, 1899, at Cedar Rapids, Iowa, he attended Mexico military academy, Mexico, Mo., and Coe college, Cedar Rapids, Iowa, receiving his bachelor's degree in 1922.

He was vice-president of Minneapolis Rotary club, a member of the board of directors of Westminster Presbyterian church and vice-commander of Downtown American Legion post, a director of the Minneapolis Athletic club and a 32nd degree Mason.

Surviving are his wife, Alberta, a daughter, Julianne, 9, both of Minneapolis, and a brother, Norris, Montebella, Calif.

JAMES E. GARNER, superintendent of motor transportation, Union Electric Company of Missouri, died July 19. He was a member of the American Gas Association's Committee on Operation of Public Utility Motor Vehicles and had made important contributions to the committee's activities.

ECONOMICS OF LP GAS OPERATION

(Continued from page 440)

will bear out the contention that LP gas companies can and are being operated on a profitable basis.

The overall picture, while favorable to LP gas operation, should not becloud the fact that there are circumstances in which the small manufactured gas property is operating under highly successful conditions. Such companies would naturally be little inclined to consider a change. In the last analysis each case will naturally be standing on its own merits. However, it is believed that sufficient tabulated data has been given based on the re-

TABLE VII (mfd)—FINANCIAL RATIOS 1944

1		2	3	4		
Co.	No.	*Annual Maintenance as Percent of Gas Utility Plant*	*Depreciation Reserve as percent of Gas Utility Plant*	*Annual Depreciation Expense as percent of Gas Utility Plant*	*Gross Income* as percent of Gas Utility Plant*	*Gross Income* as percent of Net Gas Utility Plant*
	1	2.5	14.5	1.07	2.32	2.72
	2	3.4	21.1	0	2.80	3.56
	3	0	18.5	.97	1.77	2.18
	4	4.0	0	4.05	1.69	1.69
CM	5	11.5	30.0	1.74	8.75	12.50
	6	2.8	36.5	2.66	6.15	9.65
	7†	1.4	15.6	2.77	1.63	1.93
	8‡	2.6	12.0	2.35	2.10	2.40
	9	—	—	—	—	—
	10	1.4	15.7	1.09	0	0.10
	11	1.9	46.9	1.59	3.37	6.35
	12†	1.5	17.9	1.60	4.25	5.15
	13	—	—	—	—	—
	14	1.5	23.6	1.96	1.80	2.35
CM	15	—	—	—	—	—
	16	0.5	23.6	2.90	1.82	2.38
	17	1.1	19.3	1.35	2.40	2.98
	18†	0.3	35.4	3.71	7.20	11.20
	19	1.2	17.3	1.09	0.62	0.75
	20	0.0	27.0	1.23	3.81	5.20
	21	1.2	35.6	1.34	3.38	5.27
	22	0.5	15.6	0.94	Loss	Loss
	23	—	14.5	0.84	0.22	0.27
M	24	0.0	0.0	4.44	0.00	0.00
	25	1.0	31.6	1.41	1.59	2.33
	26	2.1	28.0	1.58	4.91	6.83
CM	27	2.1	—	3.20	2.00	—
	28	0.0	40.0	0.00	—	—
M	29	0.0	52.5	2.60	Loss	Loss
CM	30	0.5	41.6	0.98	0.78	1.68

M Municipal plant no taxes; thus amount equals 45% of total operating expenses.
CM Combination municipal plant. No taxes. No segregation of accounts.
† buys 1/3 gas from another company.
‡ buys all gas from another company.

ported results of a mixed group of gas companies to enable an intelligent estimate to be made of the possibilities of a charge in gas making methods.

ACCIDENT EXPERIENCE IN 1944

(Continued from page 431)

gas accident rates for 1944 as well as the composite rates for the total industry do not include the experience of The East Ohio Gas Company. A catastrophe occurred on October 20, 1944 at the liquefied natural gas plant of this company, 73 employee fatalities resulting. This plant, in which liquefied natural gas was stored at low temperature for use during periods of peak demand on the system, was the only one of its kind. The experience of the company was excluded in order to present 1944 accident rates which would be validly comparable with rates for other years.[4]

[4] The East Ohio Gas Company's experience also was excluded from Statistical Bulletin No. 57, which contains individual utility data, because it was judged that the accident record of the company could not be fairly compared with the experience of other individual utilities. A description of the catastrophe will appear in a publication of the Association's Accident Prevention Committee describing unusual fires and explosions on gas utility properties.

If data for the company were included in the calculation of 1944 rates, frequency rates for the total industry would have been 14.6 disabling injuries per 1,000,000 hours of exposure and 3.19 injuries per 100 employees. Severity rates would have been 3.30 days charged for every 1,000 hours of exposure and 720.1 days for every 100 employees.

Corresponding frequency rates for natural gas utilities would have been 12.2 and 2.68 disabling injuries, and the severity rates would have been 4.86 and 1,067.9 days charged to disabling injuries.

FORWARD HONORED

(Continued from page 433)

Kowalke. . . . I appreciate the rare qualities necessary to keep an organization of the character of the American Gas Association going forward on an even keel, with its constantly changing officers and board members. Your wisdom and your quickness to understand new problems lighten any task—*Randall J. LeBoeuf, Jr.* . . . We will miss you in the A. G. A. work—*Frank H. Lerch, Jr.* . . . Your cordial and kindly personality has won you a place of affection with all your friends in the industry, and your able guidance of Association affairs has made for progress and achievement—*H. N. Mallon.* . . . I have for many years looked upon the Association as being Major Forward—*Alten S. Miller.*

King Solomon himself could not have done a better job (of reconciling divergent views). In every instance, a sane approach to the solution of complex problems was arrived at—*George F. Mitchell.* . . . You have done a swell job as executive head over a long period of years—*Wm. Naile.* . . . You have guided the A. G. A. to its present great position of expanded usefulness—*Henry Obermeyer.* . . . You conducted the affairs of the A. G. A. with credit to the industry—*W. H. Onken, Jr.* . . . Your consideration and understanding of the problems which we brought to you will always be remembered—*C. E. Packman.* . . . The many years you have devoted unselfishly to the A. G. A. are reflected in an institution which is honored and respected—*E. Holley Poe.* . . . How much your leadership has been valued by all who have had an opportunity to follow your wise and constructive direction in our Association's affairs—*J. J. Quinn.*

How well you carried on when the going was rough—*Hudson W. Reed.* . . . One of the most pleasant features of my State Association activities is that it has brought me into contact with men like yourself—*A. G. Schroeder.* . . . We are going to miss you, miss your wise counsel, and miss that alert mind always guiding the Association in its activities toward the betterment and enlargement of the gas industry—*Louis C. Smith.* . . . The foundation you have provided for the gas industry in your many years at the helm will prove to be a solid base for the expanded activities now contemplated—*C. V. Sorenson.* . . . You so inspired and directed the Association's activities that through it our gas industry has done its full share toward the development of our country and the welfare of its people—*Marcy L. Sperry.* . . . Congratulations on the excellent work you have done as the executive head of the Association—*D. B. Stotes.*

Most of the important and progressive developments of Home Service in the industry took place while you were managing the Association—*Ada Bessie Swann.* . . . We have always admired your administrative abilities, but have long since come to regard you more in the role of a friend and counsellor—*Edward J. Tucker.* . . . You will always be a rare inspiration—*John Van Norden.* . . . Your magnificent record through more than a score of years will make it exceedingly difficult for your successor to equal. I know of no one in the gas industry who has won the love and respect of all its members, as you have—*Jacob D. von Maur.* . . . The gas industry throughout the United States and elsewhere owes you a debt of gratitude for having developed a trade association on the highest plane of efficiency and cooperation—*F. Christopher Weber.* . . . Under your leadership so much has been accomplished—*H. Leigh Whitelaw.* . . . When you lay aside the mantle of responsibility, the gas industry will lose a great leader. You have become a symbol of its stability and dependability—*H. Carl Wolf.*

"The things I wanted were nearly always in the back, so I had this door put on"

Courtesy Crowell-Collier Publishing Co.

Australian Utility Makes War Weapons

WHILE many gas utilities throughout the world made notable contributions to the war effort, only one, The Metropolitan Gas Company in Melbourne, Australia, directly engaged in the large scale manufacture of munitions. This company's construction department produced more than five million dollars worth of war weapons, including 513 machine gun carriers, 200 tank attack carriers and 400 three-inch mortar carriers. In addition, 60 machine gun carrier hulls were dispatched to the Islington Workshops of the South Australian Railways and extensive conversion work was carried out on 567 English mortar carriers and Australian gun carriers.

The company's construction department was born in 1918 when its workshops were established to provide some guarantee of maintenance and extension of its gas-making plant as and when required. Its war work, unique in the annals of the gas industry, is commemorated in a booklet entitled "Production of Munitions" which carries photographs and descriptions of its contribution from 1940 through 1944.

New Gas-Diesel Engine Sets Efficiency Record

A NEW world record in engine thermal efficiency, higher than anything ever attained before from any internal combustion or heat engine, including the widely publicized gas turbine, is said to have been accomplished by a Cooper-Bessemer turbo-charged gas-diesel engine.

The new record thermal efficiency is in excess of 40 per cent, Edmund Frederick, assistant chief engineer, announced Aug. 24.

"This is higher than any thermal efficiency record ever accomplished by a steam, gas, gasoline, gas turbine or diesel engine," Mr. Frederick said.

"When it is considered that the best thermal efficiency of an automobile gasoline engine is not greater than 25 per cent, and various other types of steam, gas and gas turbines are much lower, some idea of the importance of this new achievement can be realized," he added. The highest thermal efficiency ever claimed for a gas turbine engine is only 29 per cent.

The record of engine thermal efficiency was attained during routine tests on one of the company's regular Type JS engines, which carried all of its own auxiliaries.

Gas Industry in the Soviet Union*

BY ENGINEER N. BABIN

FOR centuries pilgrims have journeyed to Surakhany settlement near Baku, on the shores of the Caspian Sea, to pay homage to the "eternal fires" emanating from the earth. Inextinguishable torches, they dispelled the darkness of the southern nights and set the horizons aglow. The ancient Caucasian fire worshippers erected their temples there and prostrated themselves before these unknown forces.

More centuries passed before the people learned that Surakhany's "eternal fires" were natural gas ignited and that many elements which fed them would serve as excellent fuel.

The Soviet Union holds a leading place in natural fuel gas resources, the almost inevitable companion of oil. Natural gas reservoirs, disassociated from oil, were found in the Pechora River basin, the steppes of the Volga and the Urals, the northern Caucasus, the Saratov region and other districts.

Wartime Developments

Many large industrial centres such as Baku, Kuibyshev, Lvov and Ishimbai derive their fuel entirely or partially from natural gas resources.

The war prompted a further development of natural fuel resources. Geological surveying for coal, oil and gas was intensified by instructions of the State Committee for Defence.

By the summer of 1942 the attention of surveyors was drawn to Yelshanka village, about 16 miles from Saratov. At the end of August 1942, when the battle of Stalingrad was reaching its peak, a powerful gas gusher there broke through to the surface from a trial well of only 948 feet deep. On 5th September, 1942, the Government resolved that a gas pipe be laid from Yelshanka to Saratov.

Work went on day and night, the pipe being laid simultaneously from both ends. Yelshanka gas appeared for the first time under the boilers of the Saratov power plants in October 1942. Ramified gas mains reached other factories and plants in the town, and finally brought fuel to apartment houses.

Kuibyshev, a large industrial town on the Volga, received gas at almost the same time from the pipeline of the Buguruslan oil fields. This first long range gas line of 112 miles was laid in less than a year.

Further geological research disclosed large reservoirs of gas in the Saratov region. Gas reserves here are computed in billions of cubic metres. The question arose as to how these resources should be tapped. Acting on a suggestion of Stalin at the end of 1944 the State Committee for Defence decreed that a new line be laid from Saratov to Moscow, and was launched at the end of 1944. The total length of the line will reach 497 miles. The Government has ordered that it be finished in December of this year. Moscow will then receive 1,350,000 cubic metres of gas daily—nearly 500 million cubic metres annually.

Saratov gas will annually replace more than 400,000 tons of fuel oil, or 3,150,000 cubic metres of wood. It will supply gas to thousands of Moscow homes, while dozens of factories will use it for the production of spirits, soap, glass, cement, lime, plastics and cellulose. Work on the new pipeline has been launched, and tens of thousands of workers are employed on the job.

Other Gas Fields

Another large gas project now under construction is the Dashava-Kiev pipe line, which will furnish the Ukrainian capital with gas fuel.

Ukrainian gas resources are located in the Drogobych and Stanislav regions. Two gas pockets in the Dashava and Opara villages can furnish gas fuel to the western regions of the Ukraine and Kiev for several decades.

Forty to fifty gas wells in Dashava and Opara will give Kiev a daily yield of about 1½ million cubic metres. The total length of the pipe will be 323 miles.

Soviet geologists are now searching for new gas regions and complementing available data in districts previously surveyed. The end of the war has undoubtedly accelerated the development of natural gas resources, since industry may now devote itself more intensively to the production of equipment required for gas surveying and drilling.

The Soviet gas industry, however, does not owe its rapid development to the natural product alone. Synthetic gas is being produced on a large scale. Various types of fuel will be used for the production of gas to improve the communal services. A recent government decision was that Leningrad should be completely fitted for gas fuel to be derived from slate deposits in the Estonia and Leningrad regions. Three enterprises will be erected in the Estonian Soviet Socialist Republic and the Leningrad region for its production. The pipeline will bring gas from Estonia to Leningrad. Gas mains will reach 60,000 Leningrad apartments by October, 1946, and 275,000 apartments by October 1st, 1948. Gas will also be furnished to a large number of communal enterprises essential to the population.

* Reprinted from *Gas Times*, London, Sept. 8, 1945.

Personnel Service

SERVICES OFFERED

Gas **Engineer,** formerly connected with **manufactured** and **liquefied** petroleum gas industry, just released from Army after two years service and seeks connection. Experience covers coal, carburetted and liquefied gases at low and medium pressures. Operating and sales and utilization. Army work in ETO also in gas field rehabilitating works, transmission grids, etc. Available at once. Go anywhere. **1500.**

Graduate engineer seeks position as **manufacturer's representative** or with utility as sales or technical manager. Nineteen years' experience, nine years in staff position, with utility and allied lines as industrial process engineer; planning, designing and selling gas and electric equipment. Good educational background with professional license. **1501.**

Salesman—Veteran, aggressive, capable, 10 years **air conditioning sales** experience metropolitan area, knowledge architectural and engineering trade, excellent business background, seeks position in utility industry or affiliated field. **1502.**

Executive with **management, engineering** and **legal** background and degrees. Twenty years experience in industrial and public utility production and operation. Knowledge of public relations and personnel work. Will be released from Army and available October 15. Location immaterial. Complete information furnished on request. **1503.**

POSITIONS OPEN

Distribution Engineer: Position offers real postwar future with progressive manufactured gas utility. Steadily increasing load has necessitated doubling plant capacity. Distribution System expansion requires a qualified engineer with experience in this field. Give full details of education, experience, salary expected and date available. **0428.**

Assistant to **Operating Superintendent.** Young man with engineering training. Experience in distribution and production of gas helpful but not essential. Location Midwest. Please give complete information including age, education, experience and salary expected. **0429.**

Four top flight engineering jobs open. Progressive, high-ranking manufacturer has unusual opportunities for **several qualified engineers** in Chicago Plant. Because of our greatly expanded program of production and development over pre-war operations, we have important and immediate openings for the following well-paid positions: Chief Engineer, Design Engineer, Combustion Engineer, Research Engineer. If you believe you have the experience, background, cooperative ability, are ambitious for a permanent future with a gas range manufacturer of 75 years established reputation—write your qualifications in detail. **0430.**

Distribution Superintendent, experienced in operation and maintenance of low and medium pressure manufactured gas system, meter shop operation and appliance installation and service. Company in South with 20,000 meters. **0431.**

Man with experience in **combustion** of automatic fuels, primarily gas. Familiar with laboratory technique, especially operation of gas calorimeter and orsat analysis. Prefer graduate mechanical engineer, with knowledge of testing water heaters and boilers. Splendid postwar future. State experience and salary desired. **0432.**

Eastern Gas Utility with 39,000 meters needs experienced **Industrial** and **Commercial Engineer.** Prefer man under 40 years of age. Start at once. **0433.**

Industrial Engineer—permanent connection for man 45 or under of good technical education whose experience includes knowledge of (a) cost analysis, general accounting and treasury functions; (b) production processes and operations; (c) property appraisals of land and buildings, and (d) marketing and sales programs for examinations and reports on industrial mortgage loans. Location New York City for one half year, thence San Francisco or Chicago. **0434.**

ADVISORY COUNCIL

BURT R. BAY.....Omaha, Neb.
E. J. BOYER.....Minneapolis, Minn.
LYMAN L. DYER.....Dallas, Texas
HAROLD L. GAIDRY.....New Orleans, La.
B. H. GARDNER.....Columbus, Ohio
GEORGE S. HAWLEY.....Bridgeport, Conn.
W. ALTON JONES.....New York, N. Y.
MALCOLM LEACH.....Taunton, Mass.
J. L. LLEWELLYN.....Brooklyn, N. Y.
H. N. MALLON.....Bradford, Pa.
L. A. MAYO.....Hartford, Conn.
GEORGE F. B. OWENS.....Brooklyn, N. Y.
O. H. RITENOUR.....Washington, D. C.
JOHN A. ROBERTSHAW.....Youngwood, Pa.
W. F. ROCKWELL.....Pittsburgh, Pa.
B. A. SEIPLE.....Asbury Park, N. J.
C. V. SORENSON.....Hammond, Ind.
MARCY L. SPERRY.....Washington, D. C.
R. E. WERTZ.....Amarillo, Texas
CHARLES G. YOUNG.....Springfield, Mass.

AFFILIATED ASSOCIATIONS

Association of Gas Appliance and Equipment Manufacturers
Pres.—Lyle C. Harvey, Bryant Heater Co., Cleveland, Ohio
Man. Dir.—H. Leigh Whitelaw, 60 East 42nd St., New York, N. Y.

Canadian Gas Association
Pres.—J. D. von Maur, Consumers Gas Co. of Toronto, Toronto, Ont.
Exec. Sec.-Tr.—George W. Allen, 7 Astley Ave., Toronto.

Gas Meters Association of Florida-Georgia
Pres.—W. H. Duguid, Jacksonville Gas Corp., Jacksonville, Fla.
Sec.-Tr.—B. G. Duncan, Florida Power Corp., Orlando, Fla.

Illinois Public Utilities Association
Pres.—C. W. Organ, Central Illinois Light Co., Springfield, Ill.
Sec.-Tr.—T. A. Schlink, Central Illinois Light Co., Springfield, Ill.

Indiana Gas Association
Pres.—Herman G. Horstman, Public Service Co. of Indiana, Inc., Indianapolis, Ind.
Sec.-Tr.—Paul A. McLeod, Public Service Co. of Indiana, Inc., 816 Traction Terminal Building, Indianapolis 9, Ind.

Michigan Gas Association
Pres.—Henry Fink, Michigan Consolidated Gas Co., Detroit, Mich.
Sec.-Tr.—A. G. Schroeder, Michigan Consolidated Gas Co., Grand Rapids, Mich.

Maryland Utilities Association
Pres.—Henry S. Davis, Conowingo Power Co., Elkton, Md.
Sec.—Raymond C. Brehaut, Washington Gas Light Co., Washington, D. C.

Mid-Southeastern Gas Association
Pres.—J. S. Rider, Consolidated Utilities Corp., Sumter, S. C.
Sec.-Treas.—Edward W. Ruggles, North Carolina State College, Raleigh, N. C.

Mid-West Gas Association
Pres.—Burt R. Bay, Northern Natural Gas Co., Omaha, Neb.
Sec.-Tr.—Roy B. Searing, Sioux City Gas & Electric Co., Sioux City, Iowa.

Missouri Association of Public Utilities
Pres.—J. F. Porter, Jr., Kansas City Power & Light Co., Kansas City, Mo.
Gen. Counsel—Wm. H. Allen, 101 W. High Street, Jefferson City, Mo.
Sec.—E. A. Beer, 101 W. High Street, Jefferson City, Mo.

Natural Gas and Petroleum Association of Canada
Pres.—Major E. Sweet, Brantford, Ont.
Sec.-Tr.—S. A. Morse, Union Gas Co. of Canada, Ltd., Chatham, Ont.
Asst. Sec.—Jos. McKee, United Gas and Fuel Co. of Hamilton, Ltd., Hamilton, Ont.

New Jersey Gas Association
Pres.—Frank H. Darlington, Peoples Gas Co., Glassboro, N. J.
Sec.-Tr.—H. A. Sutton, Public Service Electric and Gas Co., Newark, N. J.

Oklahoma Utilities Association
Pres.—D. S. Kennedy, Oklahoma Gas and Electric Co., Oklahoma City, Okla.
Sec.—Kate A. Niblack, 625 Biltmore Hotel, Oklahoma City, Okla.

Pacific Coast Gas Association
Pres.—O. R. Doerr, Pacific Gas and Electric Co., San Francisco, Calif.
Man. Dir.—Clifford Johnstone, 447 Sutter St., San Francisco, Calif.

Pennsylvania Gas Association
Pres.—Louis C. Smith, Harrisburg Gas Co., Harrisburg, Pa.
Sec.—William Naile, Lebanon Valley Gas Co., Lebanon, Pa.

Pennsylvania Natural Gas Men's Association
Pres.—Dan S. Keenan, Carnegie Natural Gas Co., Pittsburgh, Pa.
Exec. Sec.—Mark Shields, 2619 Grant Bldg., Pittsburgh, Pa.

Southern Gas Association
Pres.—Frank S. Kelly, Jr., Arkansas Louisiana Gas Co., Shreveport, La.
Sec.-Tr.—L. L. Baxter, Arkansas Western Gas Co., Fayetteville, Ark.

Wisconsin Utilities Association
Pres.—M. H. Montross, Wisconsin Public Service Corp., Wausau, Wis.
Exec.-Sec.—A. F. Herwig, 135 West Wells St., Milwaukee, Wis.

AMERICAN GAS ASSOCIATION

HEADQUARTERS, 420 LEXINGTON AVE., NEW YORK 17, N. Y.

A. G. A. TESTING LABORATORIES • 1032 East 62nd Street, Cleveland 14, Ohio • 1425 Grande Vista Avenue, Los Angeles, Calif.
WASHINGTON OFFICE: Albee Bldg., Washington 5, D. C.

◀ OFFICERS ▶

President ..... J. FRENCH ROBINSON ..... Cleveland, Ohio
First Vice-President and Chairman Manufactured Gas Dept. ..... E. J. BOOTHBY ..... Washington, D. C.
Second Vice-President and Chairman Natural Gas Dept. ..... R. H. HARGROVE ..... Shreveport, La.
Treasurer ..... EDWARD F. BARRETT ..... Mineola, N. Y.
Assistant Treasurer ..... V. T. MILES ..... Mineola, N. Y.
Managing Director ..... H. CARL WOLF ..... New York, N. Y.
Secretary ..... KURWIN R. BOYES ..... New York, N. Y.
Chairman, Publicity and Advertising Committee ..... C. A. TATTERSALL ..... New York, N. Y.

◀ SECTIONAL VICE-PRESIDENTS AND CHAIRMEN ▶

Accounting ..... C. E. PACKMAN ..... Chicago, Ill.
Industrial and Commercial Gas ..... HARRY K. WRENCH ..... Minneapolis, Minn.
Residential Gas ..... J. H. WARDEN ..... Tulsa, Okla.
Technical ..... L. E. KNOWLTON ..... Providence, R. I.
Manufacturers ..... FRANK J. HOENIGMANN ..... Chicago, Ill.

◀ DIRECTORS ▶

ERNEST R. ACKER ..... Poughkeepsie, N. Y.
F. M. BANKS ..... Los Angeles, Calif.
R. G. BARNETT ..... Portland, Ore.
WALTER C. BECKJORD ..... Cincinnati, Ohio
ARTHUR F. BRIDGE ..... Los Angeles, Calif.
JAMES A. BROWN ..... New York, N. Y.
CHARLES M. COHN ..... Baltimore, Md.
H. P. FELTES ..... LaPorte, Ind.
HENRY FINK ..... Detroit, Mich.
RALPH L. FLETCHER ..... Providence, R. I.
I. N. GREENE ..... Birmingham, Ala.
LYLE C. HARVEY ..... Cleveland, Ohio
D. A. HULCY ..... Dallas, Texas
NORTON McKEAN ..... Albany, N. Y.
E. P. NOPPEL ..... New York, N. Y.
BRUNO RAHN ..... Milwaukee, Wis.
HUDSON W. REED ..... Philadelphia, Pa.
HERMAN RUSSELL ..... Rochester, N. Y.
LOUIS RUTHENBURG ..... Evansville, Ind.
T. J. STRICKLER ..... Kansas City, Mo.
E. J. TUCKER ..... Toronto, Ontario
P. S. YOUNG ..... Newark, N. J.

◀ ASSOCIATION STAFF ▶

Managing Director ..... H. CARL WOLF
Assistant Managing Director ..... JOHN W. WEST, JR.
Assistant Managing Director and Director, Natural Gas Dept. ..... GEORGE H. SMITH
Secretary ..... KURWIN R. BOYES
Secretary, Manufactured Gas Dept. and Technical Section ..... A. GORDON KING
Controller and Secretary, Accounting Section ..... O. W. BREWER
Secretary, Industrial and Commercial Gas Section ..... EUGENE D. MILENER
Secretary, Residential Gas Section ..... F. W. WILLIAMS
Home Service Counsellor ..... JESSIE McQUEEN
Director, New Freedom Gas Kitchen Program ..... H. VINTON POTTER
Director, Advertising ..... CHARLES W. PERSON
Director, Publicity ..... GEORGE A. McDONALD
Director, Statistical Bureau ..... WALTER E. CAINE
Director, Testing Laboratories (Cleveland, Ohio) ..... R. M. CONNOR
Supervisor, Pacific Coast Branch Laboratories (Los Angeles, Calif.) ..... W. H. VOGAN
Secretary-Coordinator, Gas Production Research Committee ..... EDWIN L. HALL
Fuel Consultant (Washington, D. C.) ..... GEORGE W. BEAN
Utilization Engineer ..... C. GEORGE SEGELER
Editor, A. G. A. MONTHLY ..... JAMES M. BEALL

PRINTED IN U. S. A.